



# UNIFLEX CI 45

## Universal transmitter

- Compact design
- Display & operating functions
- Communication features
- High resolution
- Fast cycle times
- Two universal inputs & universal output
- Two relay outputs
- Counter/ frequency input, frequency output
- Customer-specific linearization
- Measurement value correction
- Min/max indicator ('slave pointer')

rail line

### FEATURES

- Compact design, only 22,5 mm wide
- Clips onto top-hat DIN rail
- Plug-in screw terminals or spring-clamp connectors
- Dual-line LC display with additional display elements
- Process values always in view
- Convenient 3-key operation
- Direct communication between mounted transmitters, fieldbus connections via bus coupler
- Up to two universal inputs with high signal resolution (>15 bits)
- Universal output with high resolution (14 bits) as combined voltage/current output
- One or two relay outputs
- combined counter or frequency input, frequency output
- Quick response; only 100 ms cycle time, i.e. also suitable for fast signals
- Customer-specific linearization
- Measurement value correction (offset or 2-point)
- Min/max indicator ('slave pointer')
- Logical linking of digital outputs, e.g. for common alarms

- Preset for output value

### APPLICATIONS

- ⊕ Measurement, scaling, and separation of electrical signals, e.g. for:
- ⊕ Heat treatment plants
- ⊕ Drying equipment
- ⊕ Furnace builders
- ⊕ Metallurgy
- ⊕ Kilns
- ⊕ General machine building
- ⊕ Research and development
- ⊕ Speed control, flow measuring, event counting, energy consumption collecting
- ⊕ etc.

### DESCRIPTION

UNIFLEX CI 45 transmitters are designed to give precise and cost-effective signal detection and processing tasks.

Every CI 45 has at least one universal input, one universal output and a relay.

Optionally, the transmitter can be fitted with an additional relay, with a second universal input and counter or frequency input. Optionally, the voltage output can also be used as frequency output.

Galvanic isolation is provided between inputs and outputs as well as from the supply voltage and the communication interfaces.

### Mounting

The compact CI 45 is clipped onto a top-hat DIN rail, and can also be unmounted very simply.

All connections are of the plug-in type, so that a transmitter can be replaced very quickly without disturbing the wiring.

### Display and operation

The two-line LC display permits simultaneous indication of the measured value and all of the unit's operating functions.

Moreover, a LED and 4 other display elements give a reliable indication of operating status, operating mode, and error messages.

The user-configurable engineering unit of the measured value can be included in the display. By means of the extended Operating Level, it is possible to show any signal or parameter in the 2nd display line.

### Interfaces and Engineering Tools

The transmitter settings are also configurable by means of an Engineering Tool.

Via the BlueControl® software, including the transmitter simulation and especially the convenient connection via the BluePort® front interface, the

user can solve the task in hand without having to work through operating instructions.

Of course, practically all settings can also be made from the device front.

Moreover, the CI 45 can exchange data with superordinate systems and PCs via an optional RS 485 interface with MODBUS RTU protocol that is fitted into the top-hat DIN rail.

Devices with option system interface can be connected via bus coupler to fieldbusses.

### Password protection

If required, unauthorized access to the various Operating Levels can be prevented with a password, or an entire level can be blocked.

## TECHNICAL DATA

### INPUTS

#### Survey of inputs

| Input         | Purpose                                                                 |
|---------------|-------------------------------------------------------------------------|
| INP1          | X1 (process value 1), universal input                                   |
| INP2 (option) | X2 (process value 2), universal input                                   |
| di1           | Operation disabled; Reset of stored alarms; Reset of min/max indicator. |
| di1 (option)  | Counter or frequency input                                              |

Input values can also be forced via interface.

### UNIVERSAL INPUT INP1

|                               |                                                |
|-------------------------------|------------------------------------------------|
| Resolution:                   | > 15 bits                                      |
| Decimal point:                | 0 to 3 decimals                                |
| Digital input filter:         | adjustable<br>0.0...999.9 s                    |
| Scanning cycle:               | 100 ms (only INP1)<br>140 ms (INP1 + INP2)     |
| Linearization:                | 31 segments,<br>adaptable with<br>BlueControl® |
| Measurement value correction: | 2-point or offset                              |
| Limiting frequency:           | 1,7 Hz                                         |

### Thermocouples (Table 1)

|                                 |                        |
|---------------------------------|------------------------|
| Input resistance:               | ≥ 1 MΩ                 |
| Influence of source resistance: | 1 μV/Ω                 |
| Input circuit monitor:          | sensor break, polarity |

### Cold-junction compensation

- Internal
  - additional error: typical ≤ ± 0.5 K
  - max. ≤ +1.2 K

Table 1: Thermocouple input

| Thermocouple type |                | Measurement range |                  | Error  | Typical resol. |
|-------------------|----------------|-------------------|------------------|--------|----------------|
| L                 | Fe-CuNi (DIN)  | -100...900°C      | -148...1652°F    | ≤ 2K   | 0,05 K         |
| J                 | Fe-CuNi        | -100...1200°C     | -148...2192°F    | ≤ 2K   | 0,05 K         |
| K                 | NiCr-Ni        | -100...1350°C     | -148...2462°F    | ≤ 2K   | 0,1 K          |
| N                 | Nicrosil/Nisil | -100...1300°C     | -148...2372°F    | ≤ 2K   | 0,1 K          |
| S                 | PtRh-Pt 10%    | 0...1760°C        | 32...3200°F      | ≤ 2K   | 0,1 K          |
| R                 | PtRh-Pt 13%    | 0...1760°C        | 32...3200°F      | ≤ 2K   | 0,1 K          |
| T**               | Cu-CuNi        | -200...400°C      | -328...752°F     | ≤ 2K   | 0,03 K         |
| C                 | W5%Re-W26%Re   | 0...2315°C        | 32...4199°F      | ≤ 3K   | 0,2 K          |
| D                 | W3%Re-W25%Re   | 0...2315°C        | 32...4199°F      | ≤ 3K   | 0,2 K          |
| E                 | NiCr-CuNi      | -100...1000°C     | -148...1832°F    | ≤ 2K   | 0,05 K         |
| B *               | PtRh-Pt6%      | 0(400)...1820°C   | 32(752)...3308°F | ≤ 3K   | 0,2 K          |
| Special           |                | -25 ... 75 mV     |                  | ≤ 0,1% | 0,005%         |

\* Values apply from 400°C upwards.

\*\*Values apply from -80°C upwards.

Table 2: Resistive inputs

| Type       | Sensor current | Measurement range  |                    | Error  | Typical resol. |
|------------|----------------|--------------------|--------------------|--------|----------------|
| Pt100 ***  | ≤ 0,25mA       | -200...100 (150)°C | -328...212 (302)°F | ≤ 1 K  | 0,05 K         |
| Pt100      |                | -200...850°C       | -328...1562°F      | ≤ 1 K  | 0,05 K         |
| Pt1000     |                | -200...850°C       | -328...1562°F      | ≤ 2 K  | 0,05 K         |
| KTY 11-6*  |                | -50...150°C        | -58...302°F        | ≤ 2 K  | 0,05 K         |
| Special*   |                | 0...4500 Ω**       |                    | ≤ 0,1% | 0,005%         |
| Special    |                | 0...450 Ω**        |                    | ≤ 0,1% | 0,005%         |
| Potentiom. |                | 0...160 Ω**        |                    | ≤ 0,1% | 0,005%         |
| Potentiom. |                | 0...450 Ω**        |                    | ≤ 0,1% | 0,005%         |
| Potentiom. |                | 0...1600 Ω**       |                    | ≤ 0,1% | 0,005%         |
| Potentiom. |                | 0...4500 Ω**       |                    | ≤ 0,1% | 0,005%         |

\* Default setting is the characteristic for KTY 11-6 (-50...150°C)

\*\* Including lead resistance

\*\*\* up to 150 °C at reduced lead resistance (max. 160 Ω)

Table 3: Current and voltage input

| Measurement range | Input resistance | Error   | Typical resol.(Ø) |
|-------------------|------------------|---------|-------------------|
| 0...10 V          | ≈ 110 kΩ         | ≤ 0,1 % | 0,3 mV            |
| -10...10 V        | ≈ 110 kΩ         | ≤ 0,1 % | 0,6 mV            |
| -5...5 V          | ≈ 110 kΩ         | ≤ 0,1 % | 0,3 mV            |
| -2,5...115 mV*    | > 1 MΩ           | ≤ 0,1 % | 4 μV              |
| -25...1150 mV*    | > 1 MΩ           | ≤ 0,1 % | 40 μV             |
| -25...90 mV*      | > 1 MΩ           | ≤ 0,1 % | 4 μV              |
| -500...500 mV*    | > 1 MΩ           | ≤ 0,1 % | 40 μV             |
| -200...200 mV*    | > 1 MΩ           | ≤ 0,1 % | 20 μV             |
| 0...20 mA         | 20 Ω             | ≤ 0,1 % | 0,8 μA            |

\* For INP1: high-impedance, without break monitoring

for INP2: high impedance, break monitoring always active

- External:
  - value setting: 0 ...100 °C
  - measured via INP2 (option)

### Break monitoring

Sensor current: ≤ 1 μA

Operating sense configurable

### Resistance thermometer (Table 2)

Connection technique: 3-wire or 4-wire (not available if using INP2)

Lead resistance: max. 30 Ω

Input circuit monitoring: break and short circuit

### Measurement span

Separated into ranges

Physical measurement range: 0...4,500 Ω

The BlueControl® software enables the internal characteristic curve for the KTY 11-6 temperature sensor to be adapted.

### Current and voltage measurement (Table 3)

|                                     |                                       |
|-------------------------------------|---------------------------------------|
| Span start and span:                | anywhere within the measurement range |
| Scaling:                            | freely selectable<br>-1999...9999     |
| Input circuit monitoring (current): | 12,5% below span start (2 mA)         |

### O<sub>2</sub>-measuring (option)

EMI-measuring by means of INP1 (high-impedance mV-inputs) suitable for probes with

- constant sensor temperature (heated probes), setting by means of parameter
- measured sensor temperature (non-heated probes), measuring by means of INP2

### ADDITIONAL INPUT INP2 (UNIVERSAL, OPTION)

|                               |                                      |
|-------------------------------|--------------------------------------|
| Resolution:                   | >15 bits                             |
| Digital input filter:         | adjustable, 0.0...9,999 s            |
| Scanning cycle:               | 140 ms                               |
| Linearization:                | as for INP1                          |
| Measurement value correction: | 2-point or offset                    |
| Type:                         | single-ended<br>except thermocouples |

### Thermocouples (Table 1)

#### Cold-junction compensation

- Internal
  - additional error:
  - typical:  $\leq \pm 0.5$  K
  - max.:  $\leq -2.5$  K
- External 0...100 °C

Remaining technical data as for INP1.

### Resistive sensors (Table 2)

Connection technique: 3-wire

#### Measurement span

Remaining technical data as for INP1.

### Current and voltage measurement (Table 3)

Remaining technical data as for INP1 except:

- Voltage input ranges -10 / 0...+10V and -5...+5V not possible.
- Millivolt input ranges: break monitoring always active.

### CONTROL INPUT DI1

#### Model with

##### a) Contact input

Connection of potential-free contact that is suitable for switching 'dry' circuits.

|                   |      |
|-------------------|------|
| Switched voltage: | 5 V  |
| Switched current: | 1 mA |

##### b) Optocoupler input

For active control signals.

|                  |                             |
|------------------|-----------------------------|
| Nominal voltage: | 24 V DC,<br>external supply |
| Logic '0':       | -3...5 V                    |
| Logic '1':       | 15...30 V                   |
| Current demand:  | max. 6 mA                   |

#### Control input

Configurable as direct or inverse switch or contact.

|            |                                                                                                                                                              |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| functions: | Locking front operating,<br>resetting of latched alarms, slave pointers, integrator;<br>activating tare-, sample&hold function;<br>switchover between inputs |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### Counter input (option)

Pulse counter for up or down counting, non storing

|                      |                                                                |
|----------------------|----------------------------------------------------------------|
| active edge:         | configurable                                                   |
| Count register:      | 31 bit                                                         |
| Display range:       | adjustable via counter divider, 8-digit<br>splitted to 2 lines |
| Counter divider:     | adjustable, 0.1...9,999                                        |
| Counter start value: | adjustable                                                     |
| Counter end value:   | adjustable; signalling on output                               |
| Counter processing:  | each 100 ms<br>(at add. INP2 measuring 140 ms)                 |
| Resetting:           | via front key combination, limit                               |

#### Counter input with option contact

|                        |                    |
|------------------------|--------------------|
| Count frequency, max.: | 5 Hz at square 1:1 |
| Pulse duration, min.:  | 100ms              |

#### Counter input with option optocoupler

|                                                                   |                          |
|-------------------------------------------------------------------|--------------------------|
| Count frequency, max.:                                            | 100 kHz<br>at square 1:1 |
| Pulse duration, min.:                                             | 5µs                      |
| Effects to active transmitters connected to INP1, INP2 can occur. |                          |

#### Frequenzcy input (option)

Input with option optocoupler

|                  |                              |
|------------------|------------------------------|
| Frequency range: | 0...100 kHz<br>at square 1:1 |
| Gate time:       | adjustable, 0.1... 20s       |

Process value: scalable

Effects to active transmitters connected to INP1, INP2 can occur.

### OUTPUTS

#### SURVEY OF OUTPUTS

| Output            | Purpose                                                                                                             |
|-------------------|---------------------------------------------------------------------------------------------------------------------|
| OUT1 OUT2 (relay) | Limit contact, alarms, counter end value, errors, status messages *                                                 |
| OUT3 (logic)      | Same as OUT1 and OUT2                                                                                               |
| OUT3 (continuous) | Analog output for display value, INP1, INP2, frequency value or counter value<br>Transmitter supply<br>13 V / 22 mA |
| OUT3 (U)          | Frequency output (option)                                                                                           |

\* All logic signals can be "OR-linked". Output values can also be forced via interface.

#### RELAY OUTPUTS OUT1, OUT2

|                                |                                                                     |
|--------------------------------|---------------------------------------------------------------------|
| Type:                          | 2 NO contacts with a common terminal                                |
| Max. contact rating:           | 500 VA,<br>max. 250 V, max. 2 A<br>at 48...62 Hz,<br>resistive load |
| Min. contact rating:           | 6V, 1 mA DC                                                         |
| Switching cycles (electrical): | for I=1A/2A: $\geq 800.000/500.000$<br>(at 250V AC, resistive load) |

#### Note:

If the relays OUT1 and OUT2 are used to operate external contactors, these must be fitted with RC snubber circuits to manufacturer specifications to prevent excessive voltage peaks at switch-off.

#### OUT3 AS UNIVERSAL OUTPUT

Parallel current/voltage output with common 'minus' terminal (combined use only in galvanically isolated circuits).

|                                    |                           |
|------------------------------------|---------------------------|
| Freely scalable                    |                           |
| Resolution:                        | 14 bits                   |
| Dynamic response                   | Output follows the input: |
| (step change of input signal) T90: | $\leq 540$ ms             |
| Tracking error I/U:                | $\leq 2$ %                |
| Residual ripple:                   | $\leq \pm 1$ %            |
| (rel. to range end)                | 0...130 kHz               |

#### Current output

|                            |              |
|----------------------------|--------------|
| 0/4...20 mA, configurable. |              |
| short circuit proof        |              |
| Dynamic range:             | -0,5...23 mA |

|              |                         |
|--------------|-------------------------|
| Load:        | $\leq 700\ \Omega$      |
| Load effect: | $\leq 0,02\%$           |
| Resolution:  | $\leq 1,5\ \mu\text{A}$ |
| Error:       | $\leq 0,1\%$            |

Voltage output

0/2...10V, configurable  
 not continuous short-circuit proof  
 Dynamic range: -0,15...11,5 V  
 Load:  $\geq 2\ \text{k}\Omega$   
 Load effect:  $\leq 0,06\%$   
 Resolution:  $\leq 0,75\ \text{mV}$   
 Error:  $\leq 0,1\%$   
 Additional error when using simultaneously the current output  $\leq 0,09\%$

OUT3 as transmitter supply

Output: 22 mA /  $\geq 13\ \text{V DC}$

OUT3 as logic signal

Load  $\leq 700\ \Omega$  0/ $\leq 23\ \text{mA}$   
 Load  $> 500\ \Omega$  0/ $> 13\ \text{V}$

Frequency output

Output by means of voltage output  
 frequency range: 0, 0.25...1000 Hz (square wave)  
 Output value: adjustable  
 Level: 0 / 11.5V

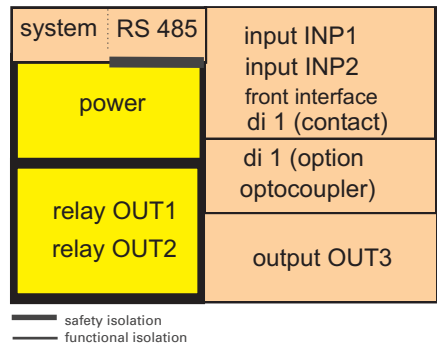
Pulse output

by means of integrator with automatic resetting  
 frequency range: 0...5 Hz  
 max. 5 Imp/s  
 Puls duration: 100ms (INP1 measuring)  
 140ms (INP1 + INP2 measuring)

GALVANIC ISOLATION

Galvanic isolation is provided between inputs and outputs as well as from the supply voltage (3-port-isolation).

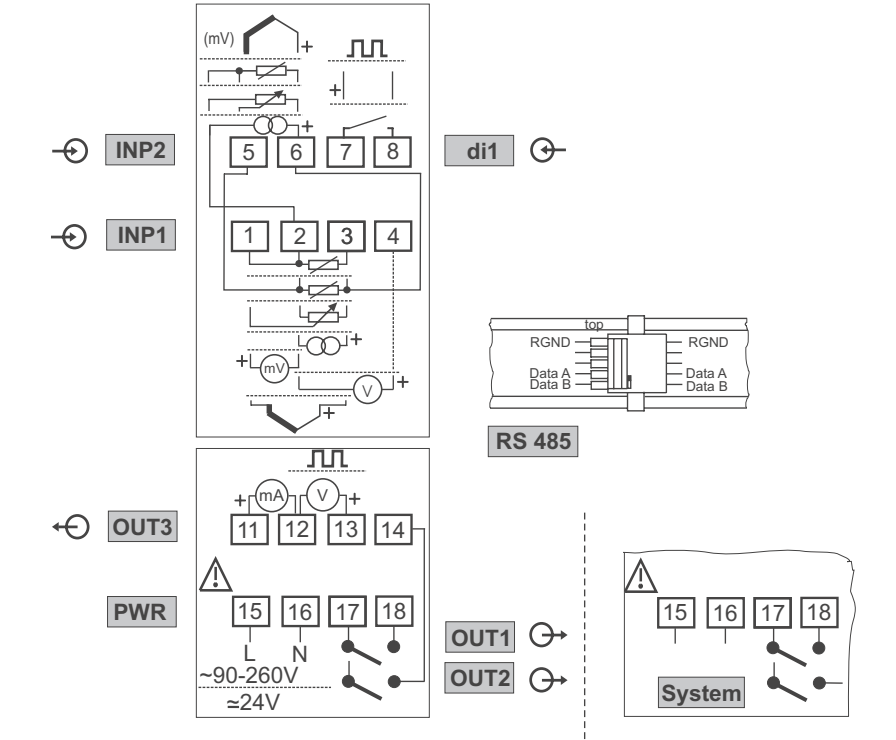
Fig. 1: Galvanic isolation



Test voltage:

|                                       |                  |
|---------------------------------------|------------------|
| Between power supply and in-/outputs: | 2.3 kV AC, 1 min |
| Between input and output:             | 500 V AC, 1min   |

Fig. 2: Connecting diagram CI 45



Isolation:  
 between in-/output against earth:  $\leq 33\ \text{V AC}$

FUNCTIONS

Process value functions

- Standard (process value X1)
- Optionally:
  - Difference control (X1 – X2)
  - Max. value selection from X1, X2
  - Min. value selection from X1, X2
  - Mean value selection from X1, X2
  - Switchover between X1 and X2
  - Oxygen measurement\* with measured or constant sensor temperature
  - Counter / frequency measuring
  - process value via INP1, CJC via INP2

\* Precise determination of O2 content by means of Nernst equation.

Signal processing

The selected input signal is converted into an analog output signal or is accessible at the interface. Depending on the selected sensor type, the following options are provided for manipulating the input signal:

- Measurement value correction (offset and 2-point)
- Scaling

- 1st-order filter with adjustable parameters (bandwidth, see below)
- Linearization with 31 segments
- $\sqrt{x}$ , with  $\sqrt{-x} = 0$
- $x^2$
- Integrator

Behaviour on sensor break/short circuit

- Response of the analog output is selectable (upscale / downscale)
- Preset substitute input value, can be disabled

Sample&Hold amplifier (option)

The sample-and-hold amplifier stores input signals which are only present for a short time. Typical applications are: storage of discontinuous set-values, and storage of signals in the case of a fault in the signal source.

Tare function (option)

Setting the tare signal the actual process value is reset to zero. Further measurements work with the offset, e.g. to subtract the tare weight.

Min/max indicator (slave pointer)

The minimum and maximum input values are stored in the CI 45, and can be displayed by means of the keys  $\blacktriangledown$  (minimum) and  $\blacktriangle$  (maximum). The values are resettable.

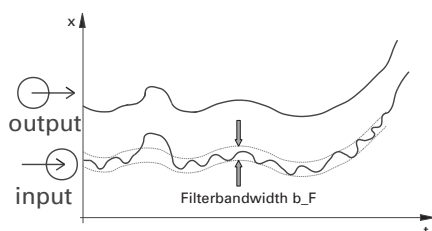
## Display of engineering units

The engineering unit for the measured value can either be selected from a predefined list of standard units, or it can be defined by the user (BlueControl®). The unit appears in the second line of the display.

## FILTER

The transmitter contains a 1st-order mathematical filter with adjustable time constant and bandwidth. The bandwidth is the adjustable tolerance range within which the filter is active above and below the process value. Measurement value changes in excess of the adjusted bandwidth are not filtered.

Fig. 3: Filter function



## LIMIT VALUE FUNCTIONS

Max, Min or Max/Min monitoring with adjustable hysteresis.

### Monitored signals

- Process value
- Input 1
- Input 2
- counter / frequency value

### Functions

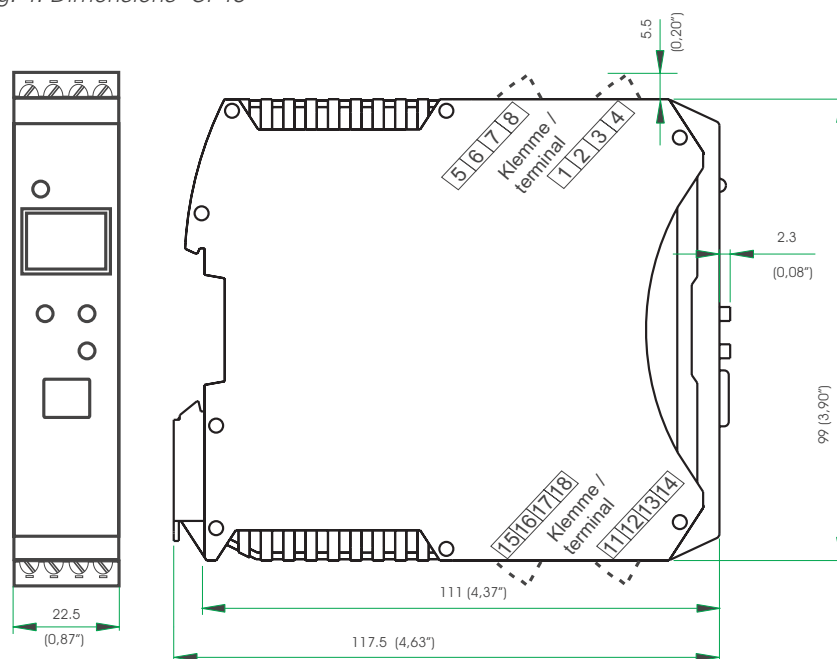
- Input value monitoring
- Input value monitoring with storage
- Signal changes / with storage
- Reset via front panel or digital input
- Alarm discriminator adjustable from 0...9999 seconds
- Several limit values and alarm messages can be logically "OR-linked".
- Limits can be used as control signals.

## ALARMS

### Sensor break / short circuit

Depending on the selected input type, the input circuit is monitored for break, short circuit, and reversed polarity.

Fig. 4: Dimensions CI 45



## MAINTENANCE MANAGER

Display of error messages, warnings, and stored limit value messages in the error list. Messages are stored, and can be reset manually.

Possible elements in the error list:

|                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------|
| Sensor break, short circuit, incorrect polarity                                                                                 |
| Stored limit values                                                                                                             |
| Heating current alarm                                                                                                           |
| Control loop alarm                                                                                                              |
| Fault during self-tuning                                                                                                        |
| E.g. Re-calibration warning (message is generated when a predefined operating time is reached)                                  |
| E.g. Maintenance interval for a switching device (message is generated when a predefined number of switching cycles is reached) |
| Internal fault (RAM, EEPROM, ...)                                                                                               |

## DISPLAY AND OPERATION

### Display

#### LCD:

dual-line plus additional display elements

#### Upper line:

4 digits, 7-segment LCD

- for process value

#### Lower line:

5 digits, 14-segment LCD; configurable contents (via BlueControl®)

- Engineering unit

- Parameters
- Extended Operating Level

### Additional display elements

4 display elements (bars in the lower line of the LCD, identified as 1, 2, F, E)

- Bars 1 and 2: OUT1/OUT2 active or INP1/INP2 active
- Bar F: Function active (planned)
- Bar E: Entry has been made in the error list

### Dual-color indicator LEDs:

- Green = OK
- Green, blinking = no data exchange with bus coupler (only for devices with system option)
- Red = limit value Lim1 triggered
- Red blinking = internal fault, configuration mismatch

### Operating functions

Only three keys at the front of the CI 45 are used to operate process values, parameters, and configuration data. Different Operating Levels and selected parameters can be disabled by means of BlueControl®.



## POWER SUPPLY

Depending on ordered version:

### AC supply

|              |                   |
|--------------|-------------------|
| Voltage:     | 90...260 V AC     |
| Frequency:   | 48...62 Hz        |
| Consumption: | approx. 7 VA max. |

### Universal supply 24 V UC\*

|              |                       |
|--------------|-----------------------|
| AC supply:   | 18...30 V AC          |
| Frequency:   | 48...62 Hz            |
| DC supply: 1 | 8...31 V DC           |
| Consumption: | approx. 4 VA/3 W max. |

Supply only from safety electrical low voltage (SELV).

\* Devices with system option:

They are supplied via the bus connector from bus coupler or power supply module.

### Behaviour with power failure

Configuration and parameter settings:

Permanent storage in EEPROM

## BLUEPORT® FRONT INTERFACE

Connection to the transmitter front via a PC adapter (see 'Accessories'). The BlueControl® software enables the CI 45 to be configured, parameters set, and operated.

## BUS INTERFACE (OPTIONAL)

### RS 485

Connection via bus connector fitted in the top-hat rail. Screened cables should be used.

Galvanically isolated

|                                         |                                           |
|-----------------------------------------|-------------------------------------------|
| Type:                                   | RS 485                                    |
| Transmission speed:                     | 2400, 4800, 9600, 19,200, 38,400 bits/sec |
| Parity:                                 | even, odd, none                           |
| Address range:                          | 1...247                                   |
| Number of transmitters per bus segment: | 32                                        |

### Protocol

- MODBUS RTU

## SYSTEM INTERFACE

For connection to fieldbus couplers (see system components)

Connection via bus connector fitted in the top-hat rail.

Technical data see data sheet 9498-737-50913.

## ENVIRONMENTAL CONDITIONS

### Protection mode

|              |       |
|--------------|-------|
| Front panel: | IP 20 |
| Housing:     | IP 20 |
| Terminals:   | IP 20 |

### Permissible temperatures

|                                               |                |
|-----------------------------------------------|----------------|
| For specified accuracy:                       | -10...55°C     |
| Warm-up time:                                 | < 20 minutes   |
| Temperature effect:                           | ≤ 0.05% / 10 K |
| add. influence to cold junction compensation: | ≤ 0.05% / 10 K |

|                   |            |
|-------------------|------------|
| Operating limits: | -20...60°C |
| Storage:          | -30...70°C |

### Humidity

Max. 95%, 75% yearly average, no condensation

### Shock and vibration

#### Vibration test Fc (DIN EN 60068-2-6)

|                        |                |
|------------------------|----------------|
| Frequency:             | 10...150 Hz    |
| Unit in operation:     | 1g or 0.075 mm |
| Unit not in operation: | 2g or 0.15 mm  |

#### Shock test Ea (DIN EN 60068-2-27)

|           |       |
|-----------|-------|
| Shock:    | 15 g  |
| Duration: | 11 ms |

### Electromagnetic compatibility

Complies with EN 61 326-1 for continuous, unattended operation.

Interference radiation:

- Within the limits for Class B devices.

Immunity to interference:

Meets the test requirements for devices in industrial areas.

Evaluation criteria:

- Surge interference partly has marked effects, which decay after the interference stops.
- With high levels of surge interference on 24 V AC mains leads, it is possible that the device is reset.
- With HF interference, effects up to 50 µV can occur.

## GENERAL

### Housing front

|                     |                  |
|---------------------|------------------|
| Material:           | Polyamide PA 6.6 |
| Flammability class: | V0 (UL 94)       |

### Connecting terminals

|                     |                                                                                          |
|---------------------|------------------------------------------------------------------------------------------|
| Material:           | Polyamide PA                                                                             |
| Flammability class: | V2 (UL 94) for screw terminals<br>V0 (UL 94) for spring-clamp terminals<br>bus connector |

### Electrical safety

Complies with EN 61010-1:  
Over-voltage category II  
Contamination degree 2  
Protection class II

### Electrical connections

Plug-in connector strips with choice of terminal type:

- Screw terminals or spring-clamp terminals, both for lead cross-sections from 0.2 to 2.5 mm<sup>2</sup>. (AWG24-12)

### Mounting method

Clip-on rail mounting (35 mm top-hat rail to EN 50 022). Locked by means of metal catch in housing base. Close-packed mounting possible.

Mounting position: vertical

### Weight:

0,18 kg

### CERTIFICATION

- CE certified
- UL / cUL certified (applied for)

## ACCESSORIES

### BlueControl® (Engineering Tool)

PC program for configuring, parameter setting, and operating (commissioning) the CI 45 transmitter. Moreover, all settings are saved and can be printed, if required.

Depending in version, a powerful data acquisition module with trend graphics is available.

### Show/hide function

The BlueControl® software enables any number of parameters and configuration setting to be shown/hidden.

Fig. 5: Interface parameters hidden, only address visible

| Name  | Description                | Visible                             |
|-------|----------------------------|-------------------------------------|
| othr  | Other                      | <input checked="" type="checkbox"/> |
| bAud  | baudrate                   | <input type="checkbox"/>            |
| Addr  | address                    | <input checked="" type="checkbox"/> |
| PrtY  | parity                     | <input type="checkbox"/>            |
| dELV  | answer delay [ms]          | <input type="checkbox"/>            |
| D.Uni | display unit               | <input checked="" type="checkbox"/> |
| O2    | parameter unit for O2      | <input checked="" type="checkbox"/> |
| Unit  | unit                       | <input checked="" type="checkbox"/> |
| dP    | decimal points             | <input checked="" type="checkbox"/> |
| SEGm  | display segment assignment | <input checked="" type="checkbox"/> |
| C.dEL | modem delay [ms]           | <input checked="" type="checkbox"/> |

This ensures that only permitted parameters & settings can be changed in the transmitter. Safety-relevant parameters are not displayed.

### Simulation function

The built-in simulation serves to test the settings.

### Import function

Engineerings of UNIFLEX CI/CB created by engineering tool ET/Uniflex can be read and transformed if possible.

### Software requirements:

Windows 95/98/NT/2000/XP

Configuration settings made only via the BlueControl® software (not via the transmitter's front keys)

- Customer-specific linearization
- Enable forcing for inputs and outputs
- Setting the limits for operating hours and switching cycles
- Switch-over to 60 Hz mains frequency
- Blocking operator functions, Operating Levels, and password definition
- Text setting
- Definition of the display contents

### Hardware requirements:

A special PC adapter (see 'Accessories') is required for connecting to the transmitter.

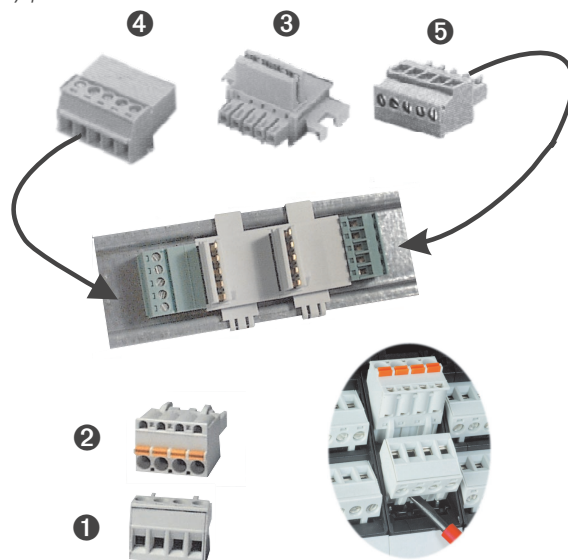
Updates and demo software from:

[www.pma-online.de](http://www.pma-online.de)

Table 4: BlueControl®, versions und functions:

| Functionality                                  | Mini     | Basic | Expert |
|------------------------------------------------|----------|-------|--------|
| parameter and configuration setting            | yes      | yes   | yes    |
| download: writes an engineering to the device  | yes      | yes   | yes    |
| online-mode / visualisation                    | SIM only | yes   | yes    |
| creation of user defined linearizations        | yes      | yes   | yes    |
| configuration of extended operation level      | yes      | yes   | yes    |
| upload: reads an engineering from the device   | SIM only | yes   | yes    |
| basic diagnosis function                       | no       | no    | yes    |
| saves files and engineering data               | no       | yes   | yes    |
| printer function                               | no       | yes   | yes    |
| online documentation / help system             | yes      | yes   | yes    |
| measurement correction (calibration procedure) | yes      | yes   | yes    |
| data acquisition and trend function            | SIM only | yes   | yes    |
| net- / multi licence                           | no       | no    | yes    |
| personal assistant function                    | yes      | yes   | yes    |

Fig. 6: Accessory parts



## ACCESSORIES

| Description                                                            | Quantity | Order no.      |
|------------------------------------------------------------------------|----------|----------------|
| ❶ Connector set with screw terminals                                   | 4 pieces | 9407-998-07101 |
| ❷ Connector set with spring-clamp terminals                            | 4 pieces | 9407-998-07111 |
| ❸ Bus connector for fitting in top-hat rail                            | 1 piece  | 9407-998-07121 |
| ❹ Plug for bus connection, connections at left, horizontal cable entry | 1 piece  | 9407-998-07131 |
| ❺ Plug for bus connection, connections at right, vertical cable entry  | 1 piece  | 9407-998-07141 |

## ADDITIONAL ACCESSORIES

| Description                                  | Language       | Order no.                                                |
|----------------------------------------------|----------------|----------------------------------------------------------|
| PC adapter for the BluePort® front interface |                | 9407-998-00001                                           |
| USB serial adaptor (USB to RS 232)           |                | 9407-998-00081                                           |
| Converter RS 232 to RS 422/485               | galv. isolated | ADAM-4520-D                                              |
| BlueControl® Mini                            | German/English | <a href="http://www.pma-online.de">www.pma-online.de</a> |
| BlueControl® with Basic license rail line    | German/English | 9407-999-12001                                           |
| BlueControl® with Expert license rail line   | German/English | 9407-999-12011                                           |

## ORDERING INFORMATION

### Transmitter UNIFLEX CI 45

C I 4 5 - 1 - 0 0 - 00

1 universal-input, 1 digital input  
with display and BluePort®-interface

**without plug-in connector terminals**  
with screw-terminal connectors

90..260V AC, mA/V/logic +1 relay  
18...30VAC/18..31VDC, mA/V/logic +1 relay  
90..260V AC, mA/V/logic +2 relay  
18...30VAC/18..31VDC, mA/V/logic +2 relay

no option  
RS 485 / MODBUS - protocol  
System interface (only for 24 V versions)

No option  
Option package 1\*  
Option package 2\*\*

Standard configuration  
Configuration to order

Standard (CE-certified)  
UL /cUL - certified \*\*\*

↑ ↑ ↑ ↑ ↑  
0 1 2 3 4 5  
0 1 2  
0 1 2  
0 9  
0 U

\* Option package 1: additional universal input INP2,  
plus: 02-measuring; counter input; functions tare, sample&hold, integrator

\*\* Option package 2: additional to option package 1:  
Digital input as optocoupler, frequency input / output

\*\*\* applied for

### Standard accessories:

- Operating notes
- Devices with 'Interface' option: bus connector  
for fitting into top-hat rail

➤ Please also order the associated **documentation:**  
(as separate item)

| Description                                    | Order no.      |
|------------------------------------------------|----------------|
| Operating instructions for CI 45 (D)           | 9499-040-71718 |
| Operating instructions for CI 45 (E)           | 9499-040-71711 |
| Interface description for Modbus rail line (D) | 9499-040-72018 |
| Interface description for Modbus rail line (E) | 9499-040-72011 |
| Interface description for PROFIBUS-DP (D)      | 9499-040-77118 |
| Interface description for PROFIBUS-DP (E)      | 9499-040-77111 |

## SYSTEM COMPONENTS

Fieldbus coupler PROFIBUS DP **RL40-112-00000-000**  
Fieldbus coupler PROFIBUS DP,  
UL / cUL certified \*\*\* **RL40-112-00000-U00**

Power supply module **RL40-119-00000-000**  
Power supply module  
UL / cUL certified \*\*\* **RL40-119-00000-U00**

\*\*\* applied for



### PMA

Prozeß- und Maschinen- Automation GmbH  
P.O. Box 31 02 29  
D-34058 Kassel  
Tel.: +49 - 561- 505 1307  
Fax: +49 - 561- 505 1710  
E-mail: mailbox@pma-online.de  
Internet: http://www.pma-online.de

### Your local representative