ControlMaster CMF160
Universal process indicator, fieldmount
Measurement made easy
Making process indication easy

Cost saving field-mount design
• Wall-, pipe- or panel-mountable
• No need for an instrument panel
• IP66 and NEMA4X environmental protection

Comprehensive display of process status
• Crystal-clear, full-color TFT display
• User customizable
• Exceptionally easy to use

Frequency input
• Direct, high accuracy connection to electromagnetic flowmeters

Totalization and counter functions
• Calculation and display of flow total values
• Pulse counting capability

Problem-solving capability
• Flexible functionality including math, logic and totalization providing power to solve complex application requirements

Duty / Assist pump control
• Control of up to 6 pumps
Overview
The ControlMaster CMF160 is a feature-packed, 1/8 DIN, universal process indicator with a unique field-mountable design that enables wall- or pipe-mounting without the need for an additional enclosure. A crystal-clear, full-color, TFT display shows operators exactly the information they need to know and provides operation and configuration menus in full text, making the CMF160 intuitive to use and very quick to install and commission.

Available as a basic indication-only model, or enhanced through plug-and-play function keys and I/O modules, the CMF160 offers totalization, level, math, logic, counter and alarm functions making it extremely flexible and able to solve many demanding application requirements.

MODBUS and Ethernet communication options ensure easy integration and connectivity to supervisory or control systems.

<table>
<thead>
<tr>
<th>Analog input module (position 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Universal process input (I/P 1)</td>
</tr>
<tr>
<td>– Thermocouple</td>
</tr>
<tr>
<td>– RTD (3- / 4-lead)</td>
</tr>
<tr>
<td>– Resistance</td>
</tr>
<tr>
<td>– mA</td>
</tr>
<tr>
<td>– V</td>
</tr>
<tr>
<td>– mV</td>
</tr>
<tr>
<td>– Frequency</td>
</tr>
<tr>
<td>– Volt-free digital input</td>
</tr>
<tr>
<td>– 24 V digital input</td>
</tr>
<tr>
<td>• Process input (I/P 2)</td>
</tr>
<tr>
<td>– Thermocouple</td>
</tr>
<tr>
<td>– mA</td>
</tr>
<tr>
<td>– V</td>
</tr>
<tr>
<td>– mV</td>
</tr>
<tr>
<td>– Volt-free digital input</td>
</tr>
<tr>
<td>– 24 V digital input</td>
</tr>
<tr>
<td>– 2 x transmitter PSU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output module (position 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 2 x analog output</td>
</tr>
<tr>
<td>• 2 x relay</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analog input module (position 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 1 x universal analog input (I/P 3)</td>
</tr>
<tr>
<td>• 1 x process input (I/P 4)</td>
</tr>
<tr>
<td>• 2 x transmitter PSU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 2 x analog / digital O/P</td>
</tr>
<tr>
<td>• 4 x relay</td>
</tr>
<tr>
<td>• 6 x digital I/O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ethernet</td>
</tr>
<tr>
<td>• RS 485 MODBUS</td>
</tr>
</tbody>
</table>
Highly scalable
The CMF160 is highly scalable in terms of both hardware and software, enabling it to meet the demands of simple indication duties through to more complex applications. The base CMF160 provides basic indication, totalization and level functionality. Templates and functionality can be increased by adding function keys to the basic model as shown in Figure 1, while retaining previous templates and functionality.

<table>
<thead>
<tr>
<th>Level</th>
<th>Function keys</th>
<th>Template</th>
<th>Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>0</td>
<td></td>
<td>Process alarms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Totalization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Volume computation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Specific gravity compensation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minimum, maximum and average calculation</td>
</tr>
<tr>
<td>Standard</td>
<td>1</td>
<td></td>
<td>Logic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Math</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Custom linearizers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delay timers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Real time alarms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bank control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Template customization</td>
</tr>
<tr>
<td>Dual</td>
<td>2</td>
<td></td>
<td>Display customization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dual PV indication</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dual PV with totalizer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dual totalizer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dual level with volume</td>
</tr>
</tbody>
</table>

Figure 1  Overview of template options
Powerful operator display
The CMF160 features a full-color 5.5 cm (2.2 in.) display for displaying detailed process information to the user. Process details such as alarm messages and diagnostic information are displayed clearly in full text without the need for difficult-to-read scrolling displays.

Example of an operator page
Automatic selection of standard display templates immediately makes best use of the CMF160’s display. Extensive customization features then enable the displayed information to be tailored to suit the process requirements.

Figure 2 Single PV indication template display

Figure 3 Dual PV and totalization display

Diagnostics and alarm status display
The diagnostics and alarm status display provides detailed information on any active alarm or diagnostic condition. The operator can see, at-a-glance, the status of any alarm condition present within the process. In addition, diagnostic messages are presented clearly to the operator, enabling rapid notification and simple diagnosis of any critical instrument status condition.

Historical information of diagnostic messages can also be viewed in the indicator’s diagnostic log.

Exceptionally easy to use
The CMF160's full text display and simple-to-navigate, pop-up menu makes operation exceptionally easy.

A programmable soft key enables commonly used functions, such as alarm acknowledgement and display selection, to be accessed easily by the operator.

Figure 5 Pop-up menu

Figure 6 Programmable soft key
Problem solving flexibility
Extensive functionality is available to provide flexible problem-solving capability; making the CMF160 much more than just a process indicator.

Process alarms
8 independent process alarms can monitor any analog signal within the CMF160, enabling extensive process monitoring capability. Alarms can be used to drive physical outputs or soft-wired to other functions within the indicator.

Real-time alarms
The ‘alarm clock’ functionality provided by the CMF160’s real-time alarms enables time-of-day decisions to be introduced into the indicator’s actions or specific functions to be triggered routinely at specified times.

Delay timers
Event sequencing is enabled through the use of the CMF160’s delay timers. A predetermined delay and output duration can be programmed into each delay timer and timers can be linked together.

Custom linearizers
The CMF160 has 2 independent 20-point custom linearizers that can be applied to any analog signal within the indicator. These linearizers can be used in applications such as level-to-volume conversion of a non-linear tank level or to accommodate special input signals or output devices.

Math
8 math blocks provide arithmetic, averaging, min. / max. hold, square root and signal switching functionality. Simple equations can be performed in a single math block or multiple math blocks can be nested together to construct complex equations.

Signal switching ‘multiplexing’ math blocks switch between 2 analog signals based on a trigger signal. For example, a backup sensor could be selected automatically on failure of a primary sensor.

Logic
8 comprehensive logic equations provide powerful interlock functionality. Inputs and outputs of the logic equations can be soft-wired to any digital signal within the indicator to maximize flexibility.

Totalizer
2 totalizers are available on the CMF160. The totalizers can configured to perform multiple functions:
- integration against an analog signal to totalize flow
- counting digital pulses
- totalization of flow based on a frequency signal from an electromagnetic flow meter

Frequency input
For maximum accuracy the CMF160 can accept a frequency signal from an electromagnetic flow meter. The frequency signal can be totalized and displayed; an instantaneous flow rate can also be calculated and displayed on screen.

Communications
Extensive communication options enable the CMF160 to be integrated into larger control systems easily or connected to other process instrumentation.

RS 485 MODBUS
Using RS 485 MODBUS, values and status can be communicated to and from the indicator in real-time via an RS 485 connection.

Ethernet
Optional Ethernet communications enable ControlMaster to be integrated in to an Ethernet network quickly. The following functionality is provided:
- Email
  - Notification of a critical process event or status can be made by email. Multiple events can trigger an email that can be sent to multiple recipients
- Webserver
  - The CMF’s integrated webserver enables the current status of the process and indicator to be viewed remotely using a standard web browser

- MODBUS TCP
  - Process values and status can be communicated to and from the CMF160 in real-time using MODBUS TCP, enabling it to be integrated easily into larger control systems or connected to a data recorder
**PC Configuration**
The CMF160 can be fully configured using ABB’s ConfigPilot software. Available free of charge, ConfigPilot enables off-line creation and editing of configuration files. Configurations are transferred to and from the indicator via its standard IrDA port and a USB IrDA adapter.

![Figure 8 Analog input configuration](image1)

![Figure 9 Profile configuration](image2)

![Figure 10 Configuration report generation](image3)
Bank control

Bank control enables improved control of multi-element output devices such as banks of heaters, pumps and fans. Aimed at minimizing wear caused by over-use of one specific ‘duty’ device, bank control enables wear to be levelled by sharing duty and assist handling between every device in the bank.

Ideal for pump control applications in the water and waste water industry. Up to six pumps can be controlled each with independent on and off trip points (see Figure 11). The CMF160’s universal process input, complete with transmitter power supply, makes it suitable for connection to many kinds of standard level transmitters.

Bank control provides users the choice of either ‘Rotate’ or ‘First In, First Out (FIFO)’ wear-levelling schedules. Rotate cycles which pump is the first to switch on during a pumping event. FIFO ensures that the last pump to switch off is the last pump to be called again. Figure 12 details Rotate and FIFO cycling for a 3-pump system.
Application templates

To minimize commissioning time, the CMF160 features up to 8 pre-configured templates. Simply selecting the required template configures the CMF160's function blocks and display automatically. Customization of the pre-configured templates is also possible, providing the flexibility to create versatile solutions.

Single PV indication

This template provides indication of a single process value.

In this example, the CMF160 is indicating the temperature of a heat treatment furnace:

![Diagram of a heat treatment furnace with temperature indication](image)

Single PV with totalization

This template adds totalization to the single PV indication template.

In this example, the CMF160 is monitoring a pipeline to provide indication of instantaneous flow rate and totalization and could be connected to the flowmeter via an analog (for example 4 to 20 mA) or frequency signal:

![Diagram of a pipeline with flow indication](image)

Single totalizer

This template provides totalization only.

In this example, the CMF160 is counting the number of products passing a specific point on a production line:

![Diagram of a production line with product counting](image)
...Application templates

Single level with volume
The single level with volume template adds level specific functions to the single PV indication template. The volume contained within a vessel can be calculated and indicated and products of varying specific gravity accounted for.

In this example, the CMF160 is monitoring the level of product in a storage tank and calculating the associated volume:

![Diagram of a single level with volume application](image)

Dual indication
This template provides indication of 2 process values. Variations of this template are available providing dual PV with totalization, dual totalization or dual level indication.

In this example, a single CMF160 is providing indication of both the flow through, and temperature of, a heat exchanger:

![Diagram of dual indication application](image)
Specification

Operation
Display
Color, ¼ VGA TFT, liquid crystal display (LCD) with built-in backlight
Language
English, German, French, Italian and Spanish
Operator keypad
6 tactile membrane keys

Security
Password protection
Basic / Advanced – user-assigned password protection (not set at factory)

Standard functions
Base templates
Single PV indication
Single PV indication + totalizer
Counter
Single PV indication + level
Dual templates
Dual PV indication
Dual PV indication + totalizer
Dual counter
Dual PV indication + level

Process alarms
Number
8
Types
High / Low process
High / Low latch
Source
Fully configurable (for example – PV, Analog input, Math block inbuilt)
Hysteresis
Level and time
Alarm enable
Enable / Disable individual alarms via a digital signal
Acknowledgement
Via front panel keys or digital signals

Real-time alarms*
Number
2
Programmable
Time
Day
Duration

Math blocks*
Number
8
Operators
+, –, x, /
Average, Maximum, Minimum
High / Low / Median select
Square root
Multiplexer

Delay timers*
Number
2
Programmable
Delay
Duration

Logic equations*
Number
8
Elements
15 per equation
Operators
OR, AND, NOR, NAND, NOT, EXOR

Custom linearizer*
Number
2
Elements
20 breakpoints

Bank control*
Number of outputs
6
Wear levelling
Rotate or FIFO

Totalizer
Number **
Up to 2
Type
Analog, digital, frequency or pulse
Statistical calculations
Average, maximum, minimum (for analog signals)
Update rate
125 ms

* Functionality level 'Standard' and above only
** Single totalizer available with base functionality, dual totalizers available with dual functionality
## Specification

### Analog inputs

**Universal process inputs**

<table>
<thead>
<tr>
<th>Number</th>
<th>1 standard</th>
<th>1 optional</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance (ohms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Wire RTD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-Wire RTD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermocouple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital volt-free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital 24 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Non-universal process inputs**

<table>
<thead>
<tr>
<th>Number</th>
<th>1 standard</th>
<th>1 optional</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermocouple *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital volt-free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital 24 V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Common mode noise rejection

> 120 dB at 50 / 60 Hz with 300 Ω imbalance resistance

### Normal (series) mode noise rejection

> 60 dB at 50 / 60 Hz

### CJC rejection ratio

**Stability**

0.05 °C/°C change in ambient temperature

### Temperature stability

0.02 %/°C or 2 µV/°C (1 µV/°F)

### Long term (input) drift

< 0.1 % of reading or 10 µV annually

### Input impedance

- > 10 MΩ (mV input)
- 10 Ω (mA input)

### Thermocouple types

B, E, J, K, L, N, R, S, T

### Resistance thermometer

Pt100

### Other linearizations

\(v_x, x^{3/2}, x^{5/2},\) custom linearization

### Digital filter

Programmable 0 to 60 s

### Display range

-9999 to 99999

### Update rate

125 ms

* Only if universal process input is configured as ‘Thermocouple’
## Inputs

<table>
<thead>
<tr>
<th>Thermocouple</th>
<th>Maximum range °C (°F)</th>
<th>Accuracy (% of reading)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>–18 to 1800 (0 to 3270)</td>
<td>0.1 % or ±2 °C (3.6 °F) (above 200 °C [392 °F]) *</td>
</tr>
<tr>
<td>E</td>
<td>–100 to 900 (–140 to 1650)</td>
<td>0.1 % or ±0.5 °C (0.9 °F)</td>
</tr>
<tr>
<td>J</td>
<td>–100 to 900 (–140 to 1650)</td>
<td>0.1 % or ±0.5 °C (0.9 °F)</td>
</tr>
<tr>
<td>K</td>
<td>–100 to 1300 (–140 to 2350)</td>
<td>0.1 % or ±0.5 °C (0.9 °F)</td>
</tr>
<tr>
<td>L</td>
<td>–100 to 900 (–140 to 1650)</td>
<td>0.1 % or ±1.5 °C (2.7 °F)</td>
</tr>
<tr>
<td>N</td>
<td>–200 to 1300 (–325 to 2350)</td>
<td>0.1 % or ±0.5 °C (0.9 °F)</td>
</tr>
<tr>
<td>R</td>
<td>–18 to 1700 (0 to 3000)</td>
<td>0.1 % or ±1 °C (1.8 °F) (above 300 °C [540 °F]) *</td>
</tr>
<tr>
<td>S</td>
<td>–18 to 1700 (0 to 3000)</td>
<td>0.1 % or ±1 °C (1.8 °F) (above 200 °C [392 °F]) *</td>
</tr>
<tr>
<td>T</td>
<td>–250 to 300 (–400 to 550)</td>
<td>0.1 % or ±0.5 °C (0.9 °F) (above –150 °C [–238 °F]) *</td>
</tr>
</tbody>
</table>

* Accuracy is not guaranteed at temperatures below this value

<table>
<thead>
<tr>
<th>RTD</th>
<th>Maximum range °C (°F)</th>
<th>Accuracy (% of reading)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100</td>
<td>–200 to 600 (–325 to 1100)</td>
<td>0.1 % or ±0.5 °C (0.9 °F)</td>
</tr>
</tbody>
</table>

## Linear Inputs

<table>
<thead>
<tr>
<th>Standard analog input</th>
<th>Accuracy (% of reading)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millivolts 0 to 150 mV</td>
<td>0.1 % or ±20 µV</td>
</tr>
<tr>
<td>Milliamps 0 to 45 mA</td>
<td>0.2 % or ±10 µA</td>
</tr>
<tr>
<td>Volts 0 to 25 V</td>
<td>0.2 % or ±20 mV</td>
</tr>
<tr>
<td>Resistance (low) 0 to 550 Ω</td>
<td>0.2 % or ±1 Ω</td>
</tr>
<tr>
<td>Resistance (high) 0 to 10 kΩ</td>
<td>0.1 % or ±5 Ω</td>
</tr>
</tbody>
</table>

## Sample Interval

125 ms per sample

## Digital Inputs

<table>
<thead>
<tr>
<th>Type</th>
<th>Volt-free or 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum pulse duration</td>
<td>Single input configured – 250 ms</td>
</tr>
<tr>
<td>Both inputs configured as analog or digital – 500 ms</td>
<td></td>
</tr>
<tr>
<td>Volt-free</td>
<td>Contact open &gt; 10 MΩ / contact closed &lt; 100 KΩ</td>
</tr>
</tbody>
</table>

## Frequency Input*

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>0 to 6000 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-signal 15 to 30 V</td>
<td>-3 to 5 V</td>
</tr>
</tbody>
</table>

*For use with devices with open collector outputs

## Outputs

### Retransmission outputs

- Number: 4 (2 standard, 2 optional)

### Isolation

- Galvanically isolated from the rest of the circuitry, 500 V for 1 minute

### Analog range

- 0 to 20 mA programmable

### Load

- 750 Ω max.

### Accuracy

- 0.25 % of output or ±10 µA

## Relays

### Number

- 6 (4 standard, 2 optional)

### Type

- Standard with changeover contacts

### Contact ratings

- 2 A, 240 V

### Update rate

- 125 ms

## Digital I/O

### Number

- 6 (standard)

### Type

- User-programmable as input or output

### Minimum input pulse duration

- 125 ms

### Input

- Volt-free:
  - contact open >10 MΩ
  - contact closed <100 KΩ

### 24 V DC:

- 1-signal 15 to 30 V
- 0-signal –3 to 5 V

### TTL

- Low: 0 to 0.8 V
- High: 2 to 5 V

### Conforms to IEC 61131-2

### Output

- Open collector output
- 30 V, 100 mA max. switched

### Conforms to IEC 61131-2

### Update rate

- 125 ms

## 2-Wire transmitter power supply

### Number

- 1 optional

### Voltage

- 24 V DC

### Drive

- 2 loops, 45 mA max.
...Specification

Communications

Note. Only one communications option can be fitted per indicator.

IrDA configuration port (standard)
Baud rate
  Up to 115 kBaud
Distance
  Up to 1 m (3 ft)
Functions
  Firmware upgrade
  Configuration upload / download

Ethernet (optional)
Type
  10BaseT
Connector
  RJ 45
Protocols
  TCP/IP
  HTTP
  MODBUS TCP (Slave)

Web server
  Built-in – enables remote monitoring using standard web browsers

Email
  • Can be configured to be sent on the occurrence of a specified event
  • Up to 3 recipients
  • Up to 4 trigger sources with configurable tag

MODBUS RTU (optional)
Baud rate
  Up to 115 kBaud
Isolation
  Galvanically isolated from the rest of the circuitry, 500 V DC for 1 minute

EMC
Emissions & immunity
  Meets requirements of IEC 61326 for an industrial environment

Environmental
Operating temperature range
  0 to 55 °C (32 to 131 °F)
Operating humidity range
  5 to 95 % RH (non-condensing)
Storage temperature range
  –20 to 70 °C (–4 to 158 °F)
Enclosure sealing
  IP 66 & NEMA 4X

Safety
General safety
  • Overvoltage Class III on mains, Class II on inputs and outputs
  • Pollution degree 2, insulation class 1

Approvals and certifications
  EN 61010-1
  cULus (optional):
    UL file number E236966
  UL Class 1, Division 2 (optional):
    • Groups A, B, C and D
    • Temperature rating T4
    • In accordance with ANSI / ISA 12.12.01-2013 and CAN / CSA C22.2 No. 213-M1987
    • UL file number E474414

Isolation

Electrical
Supply ranges
  100 to 240 V AC ±10 % (90 V min. to 264 V max.)
  50 / 60 Hz
Power consumption
  25 W max.
Power interruption protection
  No effect for interrupts of up to 60 ms

Physical
Size
  194 x 214 x 98 mm (7.6 x 8.4 x 3.8 in.)
Weight
  1.5 kg (3.3 lb) approx. (unpacked)
Panel cutout
  186 x 186 mm (7.3 x 7.3 in.)
Case material
  Glass-filled polycarbonate
Electrical connections

Analog input I/O module 1 (shown fitted)
Optional communications module (Ethernet / MODBUS)

Analog input I/O module 2 (module not fitted)

I/O module 3 option (module shown fitted)

Input 1
Input 2 Tx PSU

Relay connections 1 to 4 (standard)
Relay connections 5 and 6 (optional)

Mains supply 100 V to 240 V AC ±10 % (90 V min. to 264 V max.) 50 / 60 Hz

Fuse 3.15 A Type T 100 to 240 V, 50/60 Hz

Analog input module 1 terminal connections

Comms. connections
Digital I/O connections
Analog output connections 1 and 2 (standard)

ControlMaster CMF160 Universal Process Indicator Fieldmount | DS/CMF160-EN REV. F
## Overall dimensions

Dimensions in mm (in.)

### Transmitter

- **Cable gland kit (optional)**
  - Dimensions: 213 (8.38) x 194 (7.64) mm

### Wall mount option

- **Cable gland kit (optional)**
  - Dimensions: 200 (7.87) mm

### Pipe mount option

- **Pipe-mount kit (optional)**
  - Dimensions: 98 (3.85) x 66 (2.6) mm
  - Pipe diameters: max. 62 (2.44) / min. 45 (1.77) mm

### Panel mounting

- **Panel cut-out dimensions**
  - Dimensions: 186 (7.32) x 92 (3.6) mm
  - Panel cut-out: ≥40 (1.57) mm

* To DIN43700

**≥150 mm (6 in.) if (optional) cable glands fitted
### Ordering information

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Product ordering code example:
CMF160 A2 Y0 H2 B0 A1 A5 Y1 A1 Y-C1-M5

**When a calibration certificate is ordered it is performed according to the specified configuration type:**
CUS/ENG – Inputs and outputs calibrated according to the customer supplied configuration details and ranges.
STD – Inputs and outputs calibrated according to the instrument factory standard configuration and ranges.
Standard accessories
Included with each controller:
• Commissioning instructions

Optional accessories
• ConfigPilot PC configuration kit CM30/0715
• Pipe mounting kit CM40/0700 (page 16)
• Weathershield kit CM40/0702 (see below)
• After-sales engineered configuration service ENG/CON

Weathershield kit (pipe- and wall-mount installations)
Dimensions in mm (in.)

Acknowledgements
MODBUS is a registered trademark of the Modbus-IDA organization.