

SERIES E-8000

Digital Readout / Control Systems



> Single and Dual Channel Modules

Bronkhorst High-Tech B.V., manufacturers of advanced mass flow metering and control systems, offer digital Readout/Control Modules for use with digital Mass Flow Meters/Controllers, Pressure Meters/Controllers and other transmitters and transducers with RS232 communication. The E-8000 Series have one or two colour TFT displays per module for indication of measured/totalised values and a push button menu to easily enable the user to change the setpoint, reset the counter value, select other fluids and many functions more.

> Multi Channel Configurations

Based on the modular technique of the E-8000 series, it is easy to assemble multi channel configurations in ½ 19" and 19" housings, either for rack mount or table top. The exact number of channels to be served with one (½ 19") or two (19") power supplies, depends on the type of instruments (meters/controllers) to be connected. For most applications one power supply can serve at least four channels.



> CEM, Ex-Proof and PID controller configurations

For Controlled Evaporation Mixing (CEM) systems a single channel module for temperature control can be integrated into a 1-channel cassette and ½ 19" or 19" housings. Also for Ex-Proof instruments and configurations with third party sensors or actuators requiring a PID controller, Bronkhorst developed dedicated modules. These modules are all available with or without display and with various fieldbus options.

> Features

- ◆ Bright, wide angle, 1.8" display (TFT technology)
- ◆ User friendly operation, menu driven with 4 push buttons
- ◆ Indication/operation/configuration of
 - measured value (direct or %)
 - setpoint
 - totalised flow
 - fluid / tag number
 - control characteristics
 - fieldbus settings
 - alarm functions (min/max, response, counter)
 - fluid selection (up to 8 fluids/curves stored in MFM/MFC)

> Specifications

Mechanical:

- ◆ 1- or 2-channel table top housing (1 module)
- ◆ 1- or 2-channel cassette for panel mounting (1 module)
- ◆ ½ 19" table top housing (max. 3 modules)
- ◆ ½ 19" rack housing (max. 3 modules)
- ◆ 19" table top housing (max. 6 modules)
- ◆ 19" rack housing (max. 6 modules)
- ◆ As an option, ½ 19" and 19" housings can be supply with front handles or carrying handles
- ◆ An overview of the dimensions can be found on the last page

Electrical:

- ◆ Mains voltage 100...240 Vac (50...60 Hz)
- ◆ Output signal/setpoint signal: Digital: FLOW-BUS (RS-485) or RS-232
- ◆ Option for CEM, Ex-Proof and PID controller modules: PROFIBUS DP, PROFINET, DeviceNet™, Modbus or EtherCAT® interface
- ◆ Subminiature D-connector socket for RS-232 instrument connection
- ◆ RJ45-connection for connection with FLOW-BUS communication
- ◆ Power Supply capacity +24 Vdc, 1.25 A (30 W)



Bronkhorst®

> Model number identification

I) Model key housing, mains supply and bus options

E-8 N N N - A - N A ...

Code	Bus options
0	no external communication
A	RS232
R	FLOW-BUS
Z	specified

Code	Mains and instrument power supply
0	n.a.
1	¹⁾²⁾ 100..240Vac / 24Vdc instrument/FLOW-BUS single supply
2	³⁾ 100..240Vac / 24Vdc instrument/FLOW-BUS dual supply
3	¹⁾²⁾ 220..240Vac / 24Vdc instrument/FLOW-BUS single supply
4	³⁾ 220..240Vac / 24Vdc instrument/FLOW-BUS dual supply
5	¹⁾²⁾ 110..120Vac / 24Vdc instrument/FLOW-BUS single supply
6	³⁾ 110..120Vac / 24Vdc instrument/FLOW-BUS dual supply
7	⁴⁾ 220..240Vac Mains supply
8	⁴⁾ 110..120Vac Mains supply
9	special

Code	Handles
0	no handles
1	front handles
2	carrying handle

¹⁾ Single supply in cassette or 1/2 19" housing, max. load: 30 Watt
²⁾ Dual supply in 19" housing, max. load: 2x30 Watt
³⁾ Mains supply for CEM only

Code	Housing
1	1/2 19" tabletop housing
2	19" tabletop housing
3	1/2 19" rack housing
4	19" rack housing
5	tabletop cassette
6	panelmount cassette
9	special

II) Model key power supply modules

E-8 N N N - A - N A ...

Code	Rear panel
0	FLOW-BUS Power Supply (only at 1 st or 2 nd Supply unit)
A	2x 9pSub Instrument Power Supply

Code	Front panel
0	blind

III) Model key readout/control modules

E-8 N N N - A - N A ...

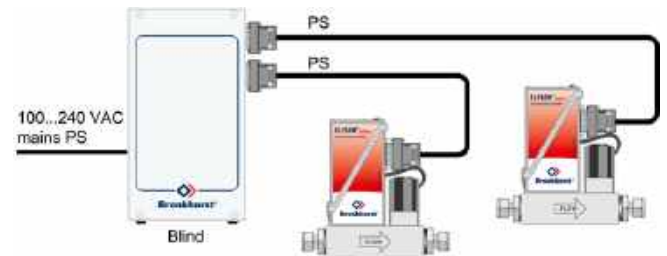
Code	Rear panel
0	none, FLOW-BUS terminal only
A	RS232 instrument readout

Code	Front panel
0	blind
1	1 display
2	2 displays

> Examples of typical CEM configurations

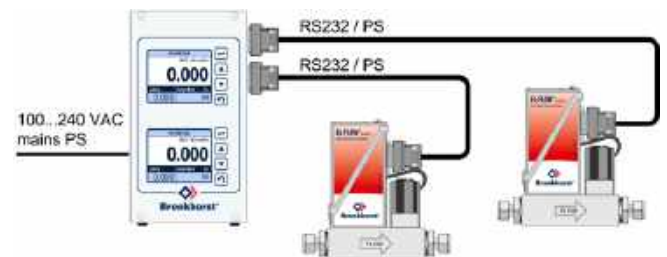
Blind power supply

By means of a blind power supply module one or two instruments can be powered (total power consumption max. 30 W). The model key for this typical example is **E-8501-0-0A**



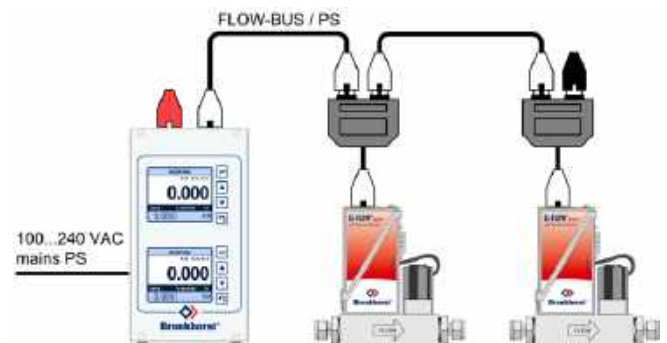
Instrument terminal

Via RS232 one or two instruments can be hooked up per module. The model key for this typical example is **E-8501-0-2A**

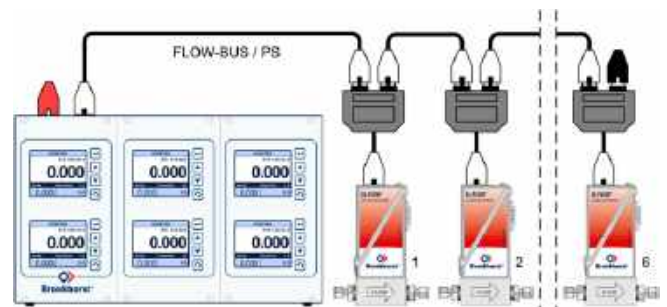


FLOW-BUS terminal

FLOW-BUS is a field bus, designed by Bronkhorst, based on RS485 technology, for digital communication between digital devices, offering the possibility of host-control by PC or digital R/C-module (E-8000 or BRIGHT). Below example shows two instruments with integrated FLOW-BUS interface in a bus configuration with an E-8000 module. The model key for this typical example is **E-8501-R-20**



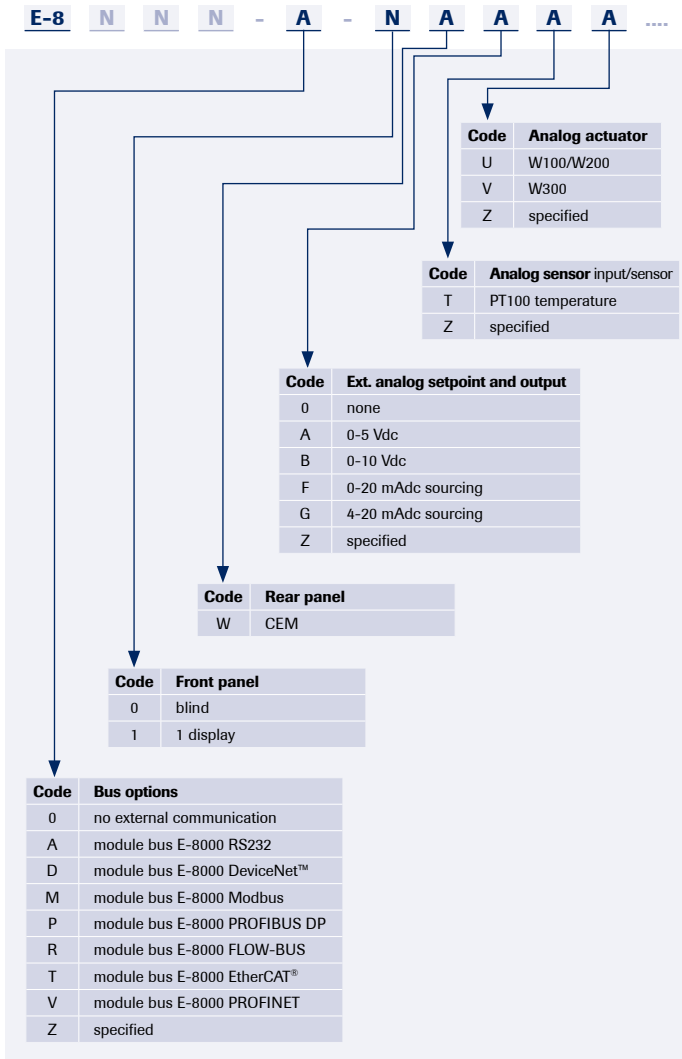
Below you will find a FLOW-BUS set-up with 6 Mass Flow Meters. The model key for this example is **E-8101-R-20-20-20**



Alternatively only one display can be used to readout these instruments sequentially; model key for this option is **E-8101-R-10-00-00**

> Model number identification

IV) Model key CEM (Controlled Evaporation Mixing) modules

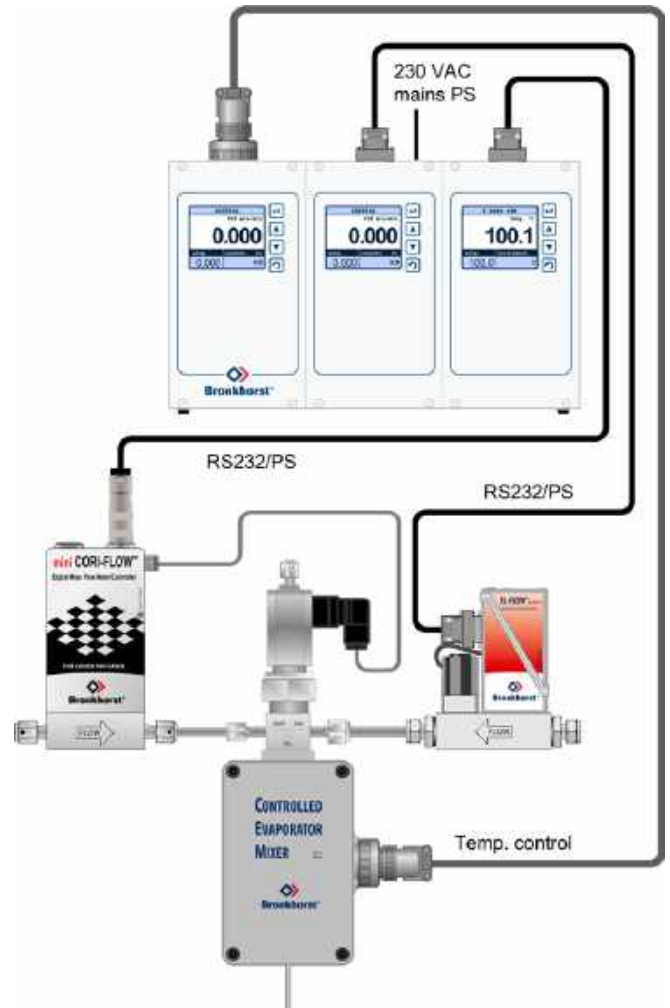


Fieldbus connections for CEM temperature control, Ex-Proof and PID controller modules.

> Examples of typical configurations

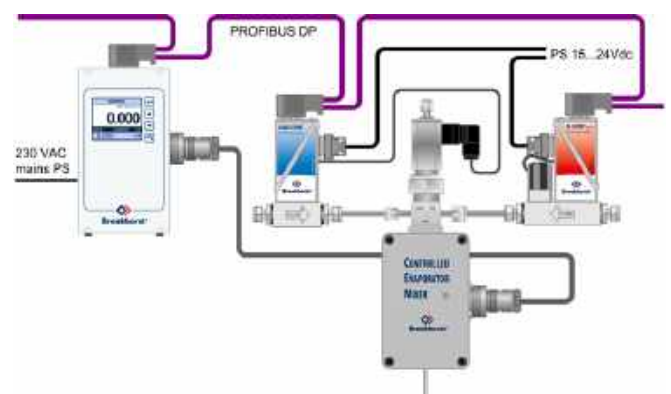
CEM-System, RS232 set-up

The following hook-up drawing illustrates a typical example of a stand-alone Controlled Evaporation Mixing (CEM) system, consisting of a Mass Flow Meter for liquid (e.g. a precursor or water used for humidification purposes), a Mass Flow Controller for carrier gas and a mixing device with subsequent heater element. The E-8000 unit powers the three devices and communicates via RS232. Model number for this example is **E-8103-0-1WATU-1A-1A**



CEM-System, fieldbus set-up

When the Controlled Evaporation Mixing (CEM) system should be part of a fieldbus system, the set-up may be arranged as in below drawing, where the devices are hook-up to a PROFIBUS network. Model number for the PS/Readout in this illustration is **E-8507-P-1WATU**



> E-8000 for Ex-Proof instruments

For applications with Ex-Proof instruments the set-up is the same. The Ex-Proof module (X) contains a barrier to separate the intrinsic safe signals from the safe zone and can be combined with additional functionality to control an XB-valve (R) or an XC-valve (S). With the digital fieldbus it is also possible to add the Ex-Proof module as a slave in a digital network.

Technical specifications

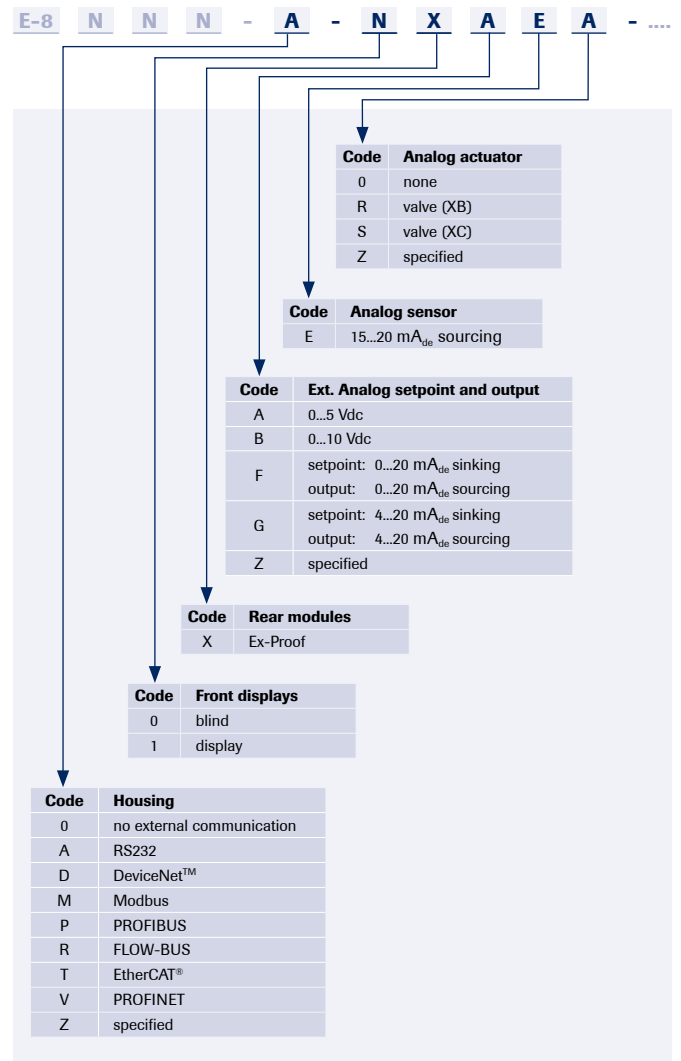
- ◆ Same set up as E-8000 (CEM)
- ◆ Additional character for Ex-Proof and actuator

Example E-8500-V-0XAE0

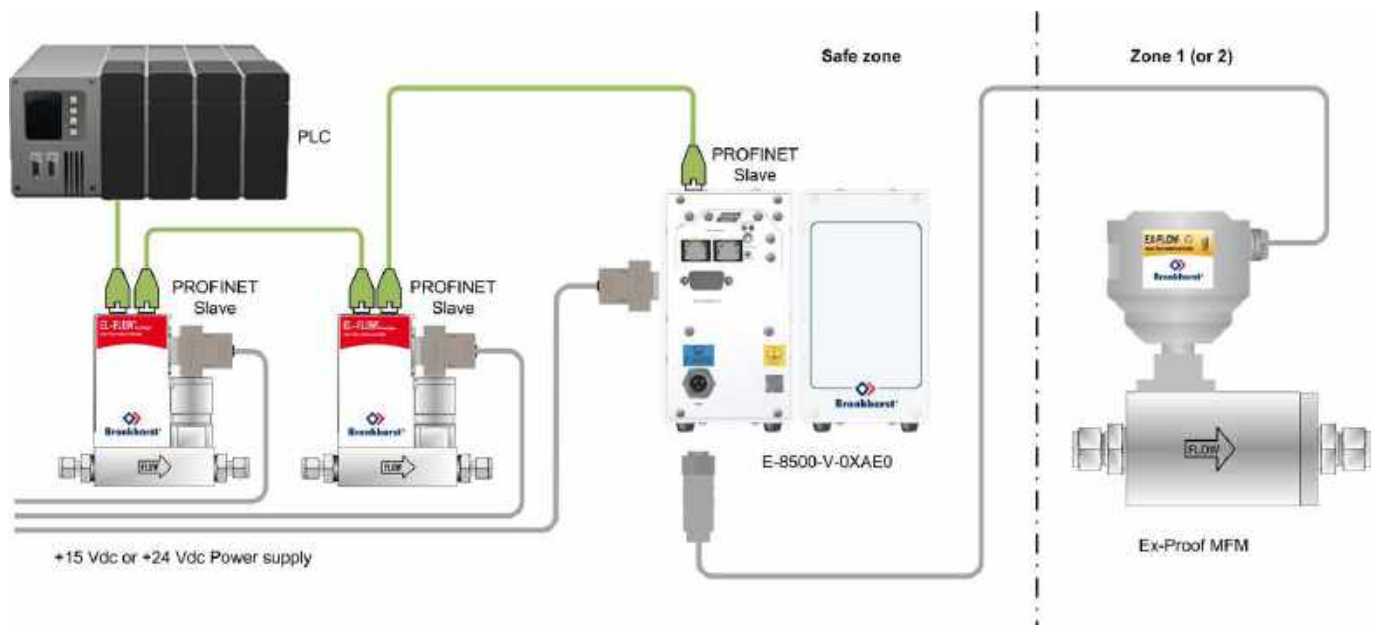
Single cassette, no power supply, PROFINET, no display, Ex-Proof MFM, 0...5 Vdc output, 15...20 mA sourcing sensor input, no actuator.



VJ Model key Ex-Proof modules



Hook-up example



> E-8000 with PID controller

For applications with external sensors and external actuators you can select a module with an integrated PID controller. It combines excellent PID control with the possibility to connect third party sensors and third party actuators. In the modelkey all the different signal possibilities shown. The available sensor and actuator options are shown in the model key.

Technical specifications

- ◆ Same set up as E-8000 (CEM)
- ◆ Additional characters for PID (C), sensor input, actuator

Example E-8501-M-1CABJ

Single cassette, power supply, MODBUS, with one display, PID controller 0...5 Vdc setpoint and output, 0...10 Vdc sensor input, 3.7...21 mA (Third party actuator).



VJ Model key PID controller modules

E-8 N N N - A - N C A A A - ...

Code	Sensor
0	none
A	0...5 Vdc
B	0...10 Vdc
F	0...20 mA _{de} sourcing
G	4...20 mA _{de} sourcing
J	3.7...21 mA sourcing (third party valve)
N	Frequency Out
P	PWM Out
Q	Pulse Out
Z	specified

Code	Sensor
0	none
A	0...5 Vdc
B	0...10 Vdc
F	0...20 mA _{de} sourcing
G	4...20 mA _{de} sourcing
H	BHT sensor (high temperature)
N	Frequency In
P	PWM In
Q	Pulse In
T	PT100 temperature
Z	specified

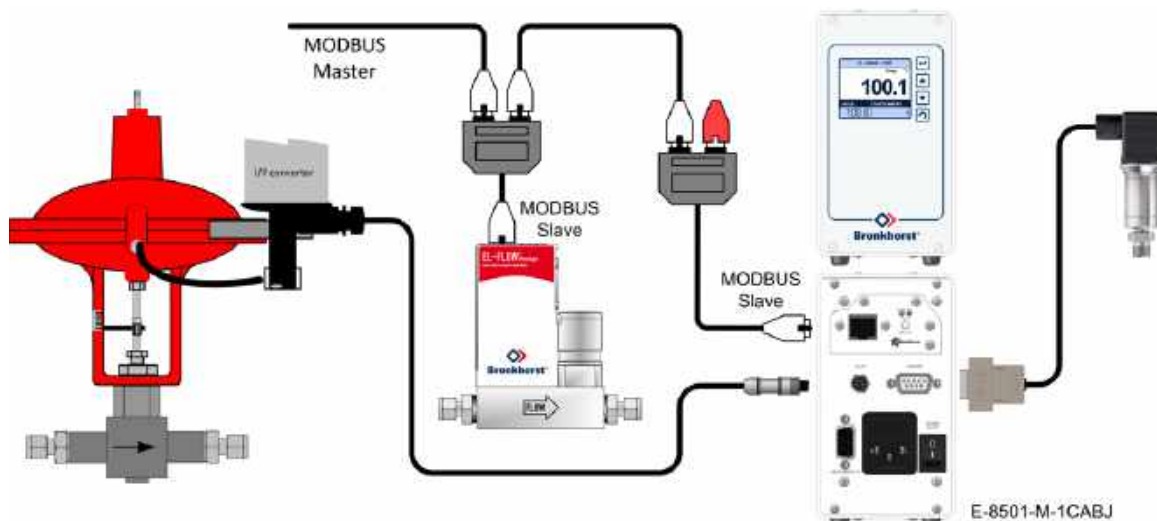
Code	Ext. Analog setpoint and output
A	0...5 Vdc
B	0...10 Vdc
F	setpoint: 0...20 mA _{de} sinking output: 0...20 mA _{de} sourcing
G	setpoint: 4...20 mA _{de} sinking output: 4...20 mA _{de} sourcing
Z	specified

Code	Rear modules
C	PID controller

Code	Front displays
0	blind
1	display

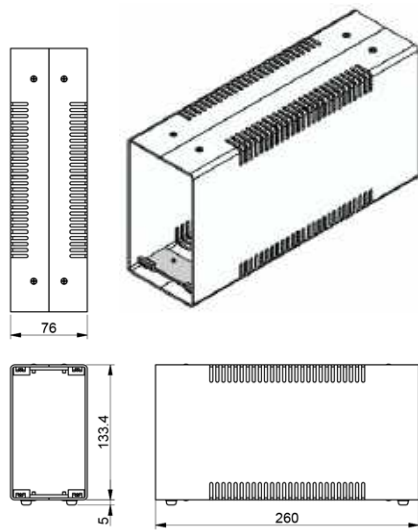
Code	Housing
0	no external communication
A	RS232
D	DeviceNet™
M	Modbus
P	PROFIBUS
R	FLOW-BUS
T	EtherCAT®
V	PROFINET
Z	specified

Hook-up example

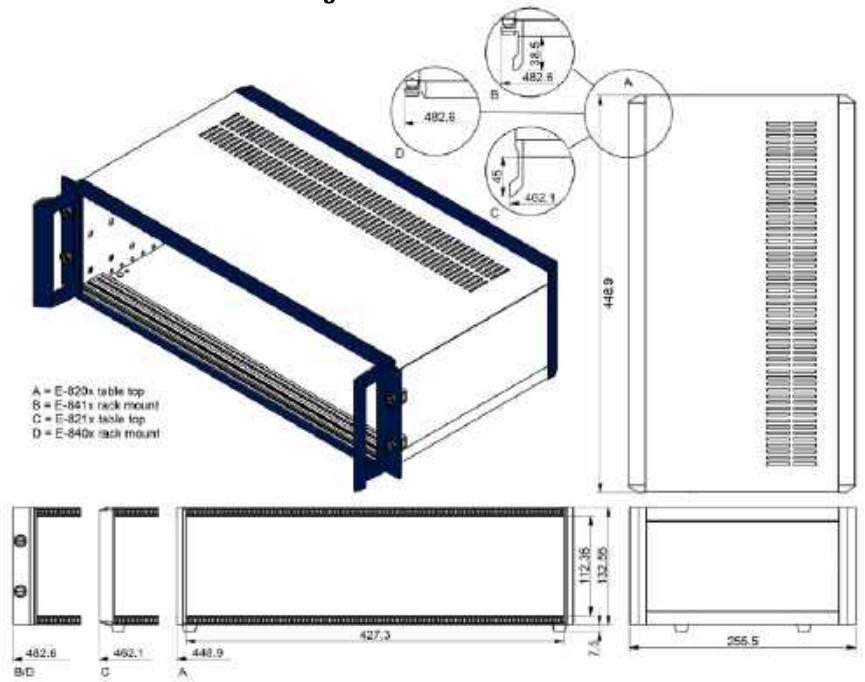


> Dimensions

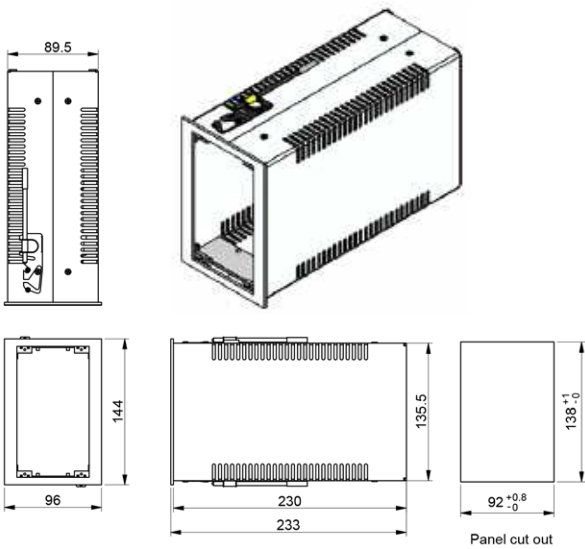
14TE Cassette table top housing



19" housing



14TE Cassette rack mount housing



1/2 19" housing

