CALMET EC10.3

Data Sheet

Current 3-phase precision isolation transformer

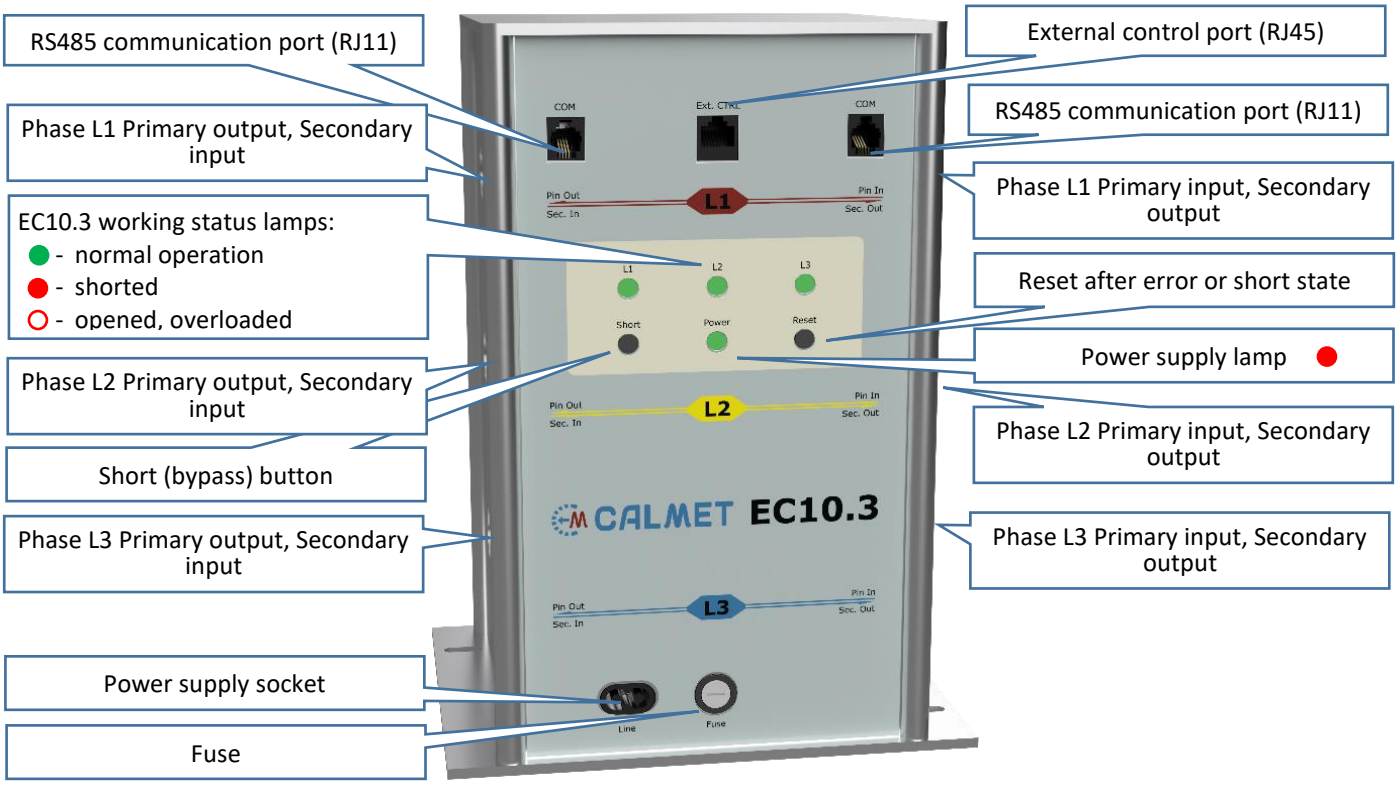
Calmet EC10.3
• High accuracy due to active, electronic error compensation
• Wide range of current 1mA – 120A
• High output power up to 60VA
• Automatic secondary open circuit protection
• Automatic overload protection with signaling
• Local bypass of transformer by push button
• Serial RS485 communication port for remote control

Calmet EC10.3 3-phase precision isolation transformer is used mainly during simultaneous, more than one, energy meter testing . When test the single or three phase meters, the voltage and current circuit cannot be separated (meters with "IP Link" or "closed link"), there is a need to isolate the voltage and current circuit. Lack of isolation cause unpredicted current flows between meters, what decreases accuracy especially for low currents. The current isolation method by means of current transformers is needed to ensure the test accuracy.

Calmet EC10.3 has a great accuracy due to active, electronic compensation. It is fully protected against overload or secondary open circuit and signals all actual operation state. The secondary output can be locally shorted if not used or meter under test is exchanged. The transformer can be also controlled remotely by means of RS485 interface.

Technical specification							
Nominal frequency:		45Hz … **50Hz** … 55Hz or 54Hz … **60Hz** … 66Hz					
Nominal ratio:		1:1 (primary = secondary)					
Current range:		1mA … 120A					
Accuracy class:		0.01 (50mA … 120A)					
Error characteristic							
Range of current:		**50mA … 120A**		**10mA … 50mA**		**1mA … 10mA**	
Ratio error	typical	≤ ± 0.005%		≤ ± 0.01%		≤ ± 0.02%	
	max.	≤ ± 0.01%		≤ ± 0.03%		≤ ± 0.04%	
Phase shift error		≤ ± 0.2'		≤ ± 0.7'		≤ ± 0.8'	
Output power and burden (per phase)							
Current range:	**120A**	**100A**	**80A**	**60A**	**10A**	**1A**	**100mA**
Power max.	60VA	50VA	40VA	30VA	5VA	0.5VA	50mVA
Primary loss max.	6VA	5VA	4VA	3VA	insignificant		
Input burden	0.7mΩ for primary cable length 1m and cross section 25mm^2						
Output burden max.	4.2mΩ	5 mΩ	6.3 mΩ	8.3 mΩ	50 mΩ	500 mΩ	500 mΩ
Output voltage max.	0.5V						
General parameters							
Auxiliary supply:	85V … 135V AC or 185 … 265V AC / 47Hz … 63Hz						
Power consumption	≤ 25VA						
Dimensions(w•d•h):	200mm • 164mm • 270mm						
Cable hole diameter:	21mm						
Weight	12kg						
Operation temp.	-10°C … +50°C						
Storage temp.	-20°C … +60°C						
Temp coefficient:	≤ 0.003%/°C (0°C … +40°C) or ≤ 0.005%/°C (-10°C … 0°C) ∪ (40°C … +50°C)						

Transformer description

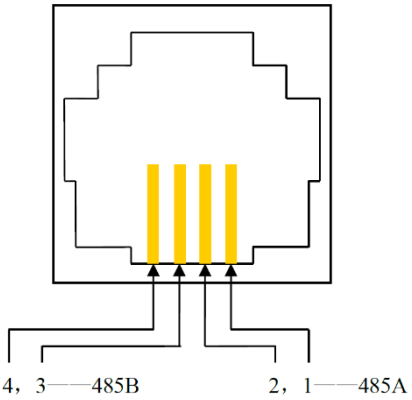


Calmet EC10.3 is powered up by auxiliary mains supply. Power supply is protected by fuse. During switching ON of power supply all meters must be unconnected. All three phases L1, L2 and L3 are symmetric. Please notice that primary cable input and output are on opposite side to the secondary cable input and output. Just after power supply connection the lamp "Power" is lighting. If all cables are properly connected also lamps L1, L2 and L3 are lighting in **green**. In case of opened secondary circuit or overloaded secondary circuit the lamps L1, L2 and L3 are blinking in **red**. There is local possibility to "short" (bypass) secondary output in case it is not used or meter under test is disconnected. This can be done by means of "Short" push button. In such case also lamps L1, L2 and L3 are lighting in **red**. To finalize the "short" state or recover normal operation after error there is push button "Reset". Transformer EC10.3 can be controlled also in remote way. It can be done by binary 5V signals to get "Short" or "Reset" state, or read actual working status of transformer. The same can be done by means of serial interface RS485, which can be also connected in series with more transformer units.

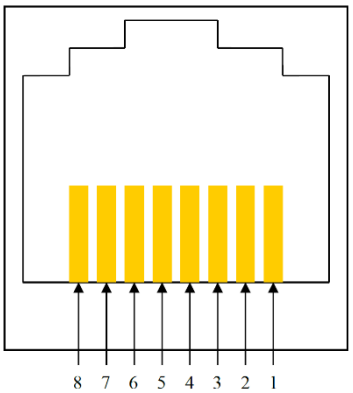
Remark! Before pressing "Short" or "Reset" button or induce this state in remote way, reduce the flowing current from source to 0. Before switching ON of power supply all meters under test must be unconnected.

Connection ports description

RJ11 – RS485 socket pins

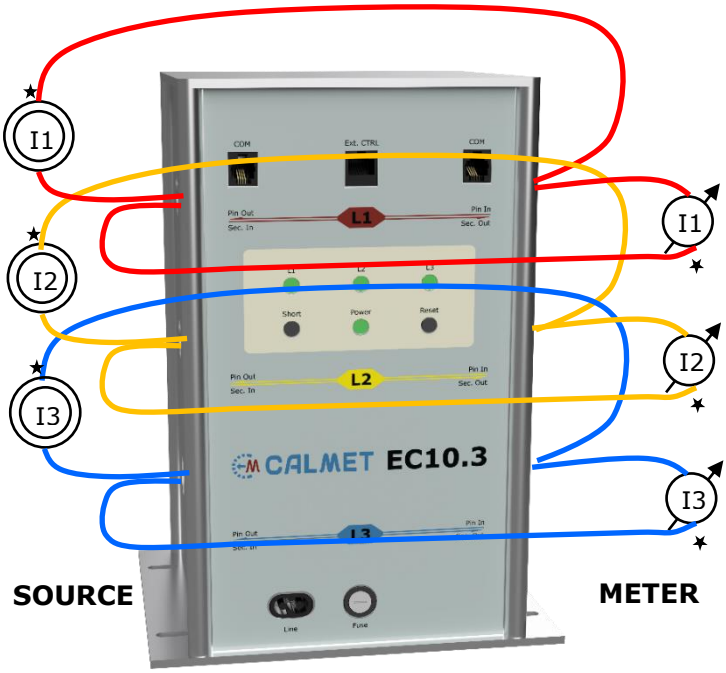


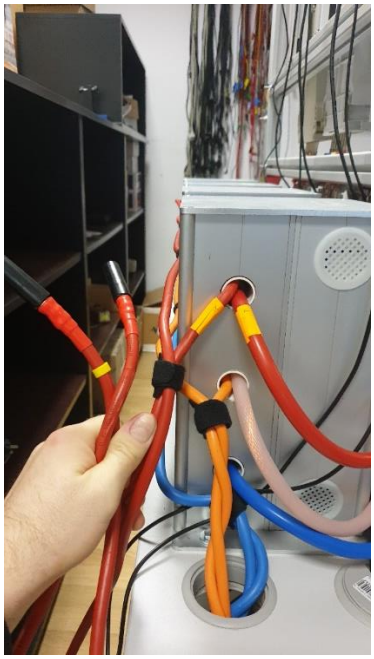
RJ54 socket for remote control



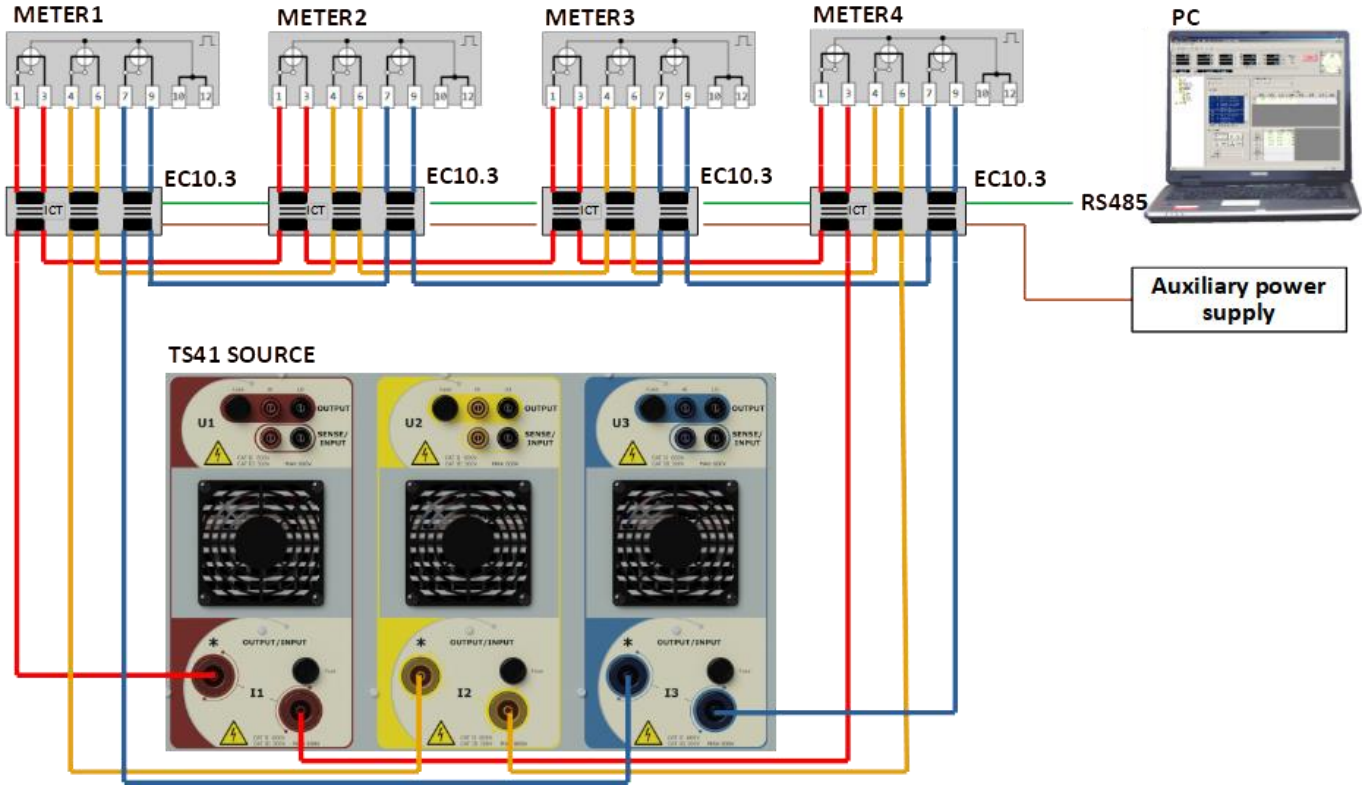
1 - +5V
2 – Reset function (0V active)
3 – Short function (0V active)
4 – L3 state (+5V – normal, 0V – alarm)
5 – GND
6 – L2 state (+5V – normal, 0V – alarm)
7 - GND
8 – L1 state (+5V – normal, 0V – alarm)

Wiring diagram of EC10.3





Application of EC10.3 in four position test bench station



PC laptop with USB interface

USB to RS485 converter
preferred with isolation

RJ11 4p4c connector

Isolation transformer EC10.3 can be controlled remotely by means of RS485 interface. Each unit of EC10.3 may have be assigned to the communication number address in range 1 … 254.

Data format used by EC10.3:

- Speed rate – 19200 bits/sec;
- Data bits number – 8;
- Stop bit – 1;
- Parity – even;
- Handshaking – no handshake.

Commands frame for EC10.3:

Command	Separator	ID	Separator	Parameter	End mark	Function
reset	,	1 – 254, 255			;	Resetting EC10.3 after error or short
short	,	1 – 254, 255			;	Shorting EC10.3 output
state	,	1 – 254			;	Checking EC10.3 state
setID	,	1 – 254	,	1 – 254	;	Setting number for EC10.3
save	,	1 – 254, 255			;	Saving number at EC10.3
init	,	1 – 254, 255			;	Initialization of EC10.3

Remark: ID 255 means transmitting, ID 0 has no meaning.

Examples of communication:

Command	Answer	Meaning
init, 4;		Setting transformer ID 4 to default value 1
setID,2,4;	OK;	Change transformer ID from 2 -> 4; requires "save" command for permanent setting; in other case the value will be lost after power supply switch off
save,4;	OK;	Permanent setting transformer ID to 4;required after "setID" command
reset,4;	OK;	Resetting after error condition or "short" command
state,4;	state,4,0,0,0;	State of EC10.3 transformer; ID, L1, L2, L3; 0- normal state, 1 – bypass state; in example: ID=4, L1, L2, L3 in normal operation
short,4;	OK;	Setting EC10.3 output in bypass mode (output shorted)
state,4;	State,4,1,1,1;	State of EC10.3 transformer; ID, L1, L2, L3; 0- normal state, 1 – bypass state; in example: ID=4, L1, L2, L3 secondary shorted

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