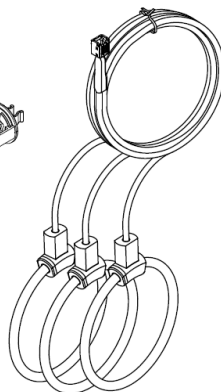# EMS BTDIN – Multifunction Measuring module with open Rogowski coils

Cat. Nos: F80BMR630, F80BMR1600, F80BMR3200, F80BMR6300, F80BMKIT1, F80BMKIT3

F80BMR630
F80BMR1600
F80BMR3200
F80BMR6300

F80BMKIT1
F80BMKIT3

x3

Contents
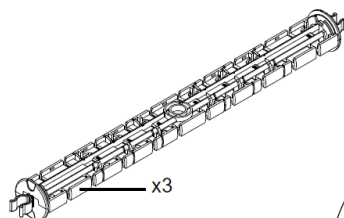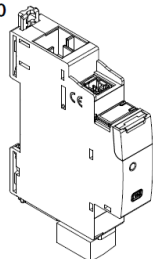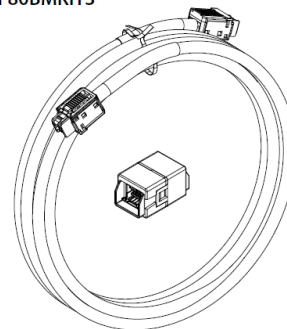
EMS BTDIN - Multifunction Measuring module with open Rogowski coils

Cat. Nos: F80BMR630, F80BMR1600, F80BMR3200, F80BMR6300, F80BMKIT1, F80BMKIT3

1. DESCRIPTION - USE

. Module dedicated to Energy Management System (EMS BTDIN) use.

Multifunction Measuring module for high currents.

Measures the main electrical data of a single-phase or three-phase network.

The insertion is done by open flexible Rogowski coils.

Symbol:

2. RANGE

. Cat. n° F80BMR630: Multifunction measuring module (1 module. 17,8 mm width) delivered with n°3 centering plastic supports and flexible Rogowski coils to measure a three-phase circuit up to 630 A

. Cat. n° F80BMR1600: Multifunction measuring module (1 module. 17,8 mm width) delivered with n°3 centering plastic supports and flexible Rogowski coils to measure a three-phase circuit up to 1600 A

. Cat. n° F80BMR3200: Multifunction measuring module (1 module. 17,8 mm width) delivered with n°3 centering plastic supports and flexible Rogowski coils to measure a three-phase circuit up to 3200 A

. Cat. n° F80BMR6300: Multifunction measuring module (1 module. 17,8 mm width) delivered with n°3 centering plastic supports and flexible Rogowski coils to measure a three-phase circuit up to 6300 A

. Cat. n° F80BMKIT1: kit consisting of n°1 Rogowski coils extension cable of 1000 mm length + n°1 Extension connector.

. Cat. n° F80BMKIT3: kit consisting of n°1 Rogowski coils extension cable of 3000 mm length + n°1 Extension connector.

Allow to increase the length of Rogowski coils cable: cords are clipped to either side of the connector.

Maximum total allowed length: 5 meters *(Rogowski coils cables: 2 m; Extension cable: 3 m).*

Rated current:

. Cat. No F80BMR630:
 Min current, Imin: 12,5 A
 Base current, Ib: 250 A
 Max current, Imax: 750 A

. Cat. No F80BMR1600
 Min current, Imin: 32,5 A
 Base current, Ib: 650 A
 Max current, Imax: 1950 A

. Cat. No F80BMR3200:
 Min current, Imin: 65,0 A
 Base current, Ib: 1300 A
 Max current, Imax: 3900 A

. Cat. No F80BMR6300:
 Min current, Imin: 125,0 A
 Base current, Ib: 2500 A
 Max current, Imax: 7500 A

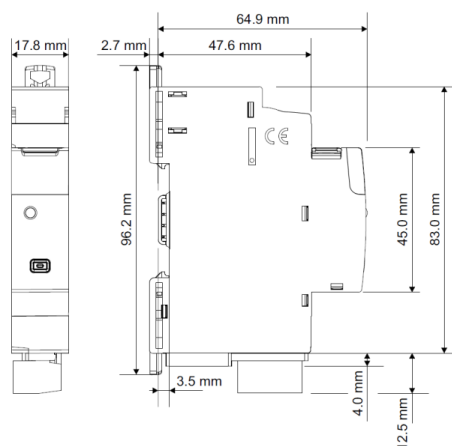## 2. RANGE *(continued)*

Insertion rated voltages:

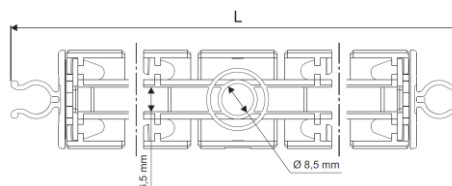. Un: 110÷500 V~ (phase/phase)

Rated frequency:

. fn: 50/60 Hz
. Admitted variation:
 45 ÷ 55 Hz (fn 50 Hz)
 55 ÷ 65 Hz (fn 65 Hz)

3. OVERALL DIMENSIONS

. F80BMR630, F80BMR1600, F80BMR3200, F80BMR6300: Module

. Centering Plastic support:

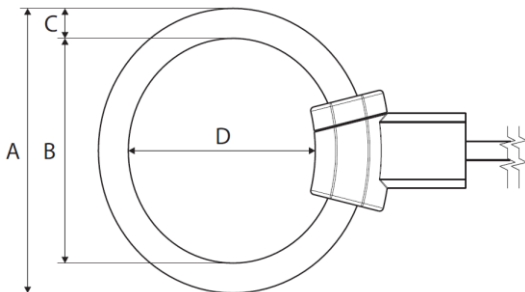| Cat. n°	L (mm)
F80BMR630	79
F80BMR1600	123
F80BMR3200	173
F80BMR6300	263

3. OVERALL DIMENSIONS *(continued)*

. F80BMR630, F80BMR1600, F80BMR3200, F80BMR6300 *(continued)*:

Rogowski coils
Common dimensions
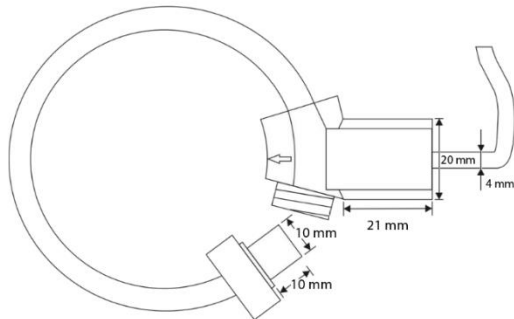
Specific dimensions

	A (mm)	B (mm)	C (mm)	D (mm)
F80BMR630	76	60	8	50
F80BMR1600	121	105	8	100
F80BMR3200	171	155	8	150
F80BMR6300	261	245	8	240

. Rogowski sensor(s) - Cable length

2000 mm
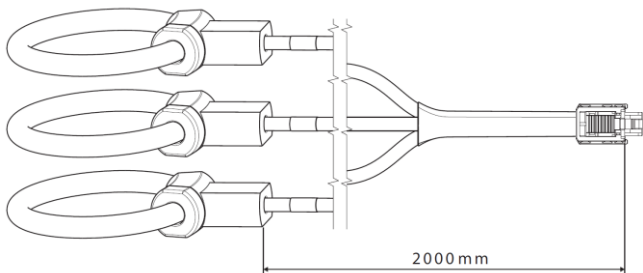
This length can be stretched via the Extension cable + connector up to 5 meters (2 m of Rogowski cable and up to 3 m of extension)

3. OVERALL DIMENSIONS *(continued)*

. F80BMKIT1, F80BMKIT1:
. Rogowski coils extensions

L

Cat. n°	L (mm)
F80BMKIT1	1000
F80BMKIT3	3000

. Extension connector

17.4 mm

15.0 mm

30.0 mm

4. PREPARATION - CONNECTION

Fixing:
. On symmetric rail EN/IEC 60715 or DIN 35 rail

Operating positions:
. Vertical,   Horizontal,   Upside down,   On the side

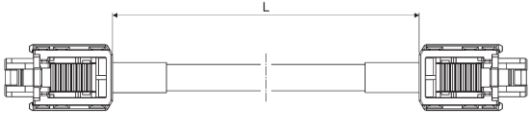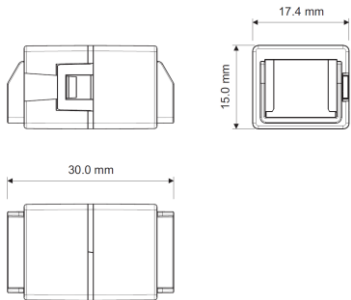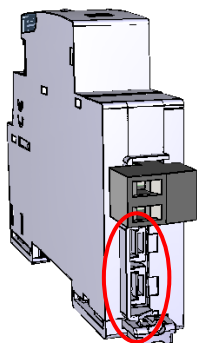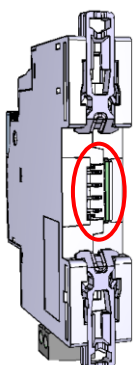### Power Supply:
. Mandatory in 12 VDC via the specific Power supply module Cat n°F80BA

. Two ways:

 via specific communication patch cords (cat. nos F80BC250/500/1000) to connect at the downstream through dedicated ports

 via specific communication rails (cat. nos F80BR18/24/36) to connect at the rear through dedicated connectors

Voltage terminals:
The removable black terminal is used to connect voltage(s)

. Terminal depth: 8 mm.

. Stripping length: 8 mm

Screw head:
. Screw slotted.

Recommended tightening torque:
. 0,5 Nm.

Recommended tools:
. For the terminals: flat screwdriver 3,5 mm.

. For fixing: flat screwdriver 5.5 mm (6 mm maximum).

4. PREPARATION – CONNECTION (continued)

Connectable section:
. Copper cables.

Voltage measurement terminals

	Without ferrule	With ferrule
Rigid Cable	1 x 0,5 mm² to 2,5 mm² 2 x 1,5 mm²	-
Flexible Cable	1 x 0,5 mm² to2,5 mm² 2 x 1,5 mm²	1 x 0,5 mm² to 2,5 mm² 2 x 1,5 mm²

Wiring diagrams:

3 wires three-phase network, 3 sensors (3-3E):

F: 0,5 A gG
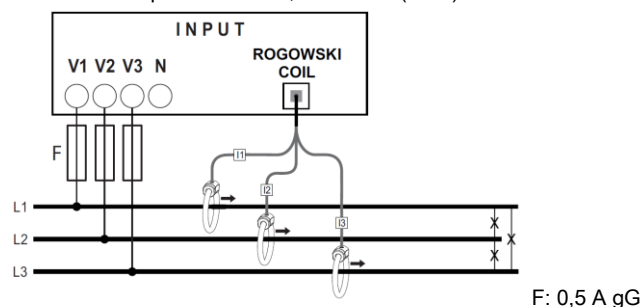
4 wires three-phase network, 3 sensors (3N-3E):

F: 0,5 A gG
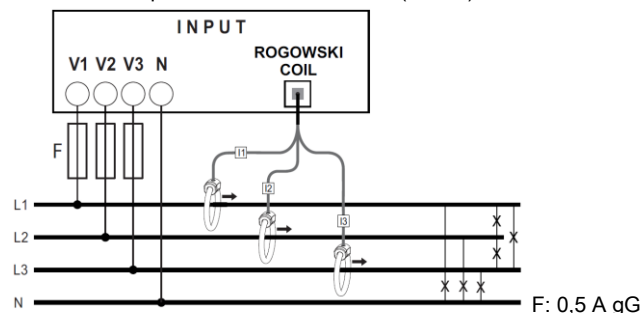
. Rogowski coils cables length (see § Overall Dimensions) in addition to the extension cables, allow you to put EMS BTDIN Measure modules everywhere in the installation.

This is not mandatory to have them near to the associated protection device of the measured line.

Note: Install the flexible Rogowski coils according to the direction indicated by the arrow moulded on the coil core.

From Network

To Load
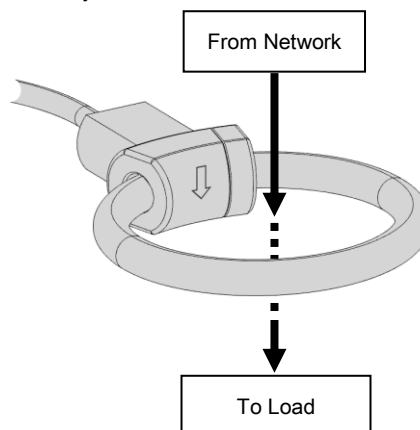
EMS BTDIN - Multifunction Measuring module with open Rogowski coils

Cat. Nos: F80BMR630, F80BMR1600, F80BMR3200, F80BMR6300, F80BMKIT1, F80BMKIT3

4. PREPARATION – CONNECTION *(continued)*

Use of Extension kit:
Cords are to be clipped to either side of the connector.

F80BMKIT1 = 1 m	x3 max.
F80BMKIT3 = 3 m	x1 max.

Use of the Centering plastic supports:
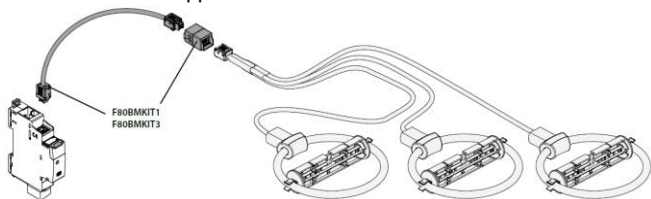Centering supports allow you to install Rogowski coils correctly centred on the conductor/bar to ensure measurements accuracy. The supports can be fixed to different types of conductors in order to adapt flexibly to different installation solutions, new or existing.

. Cables or cylindrical bars
fix the centering support with a Cable tie Colring - max. width 6 mm
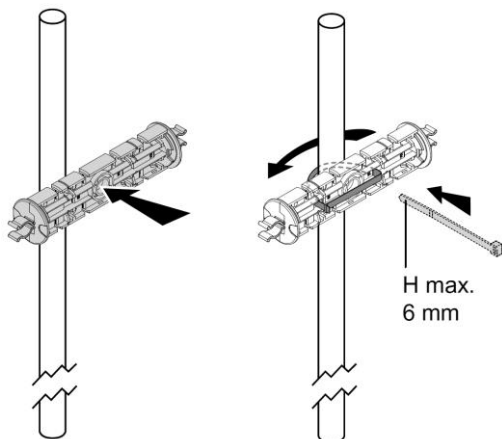
H max. 6 mm

fix the Rogowski flexible coil to the support and close it.
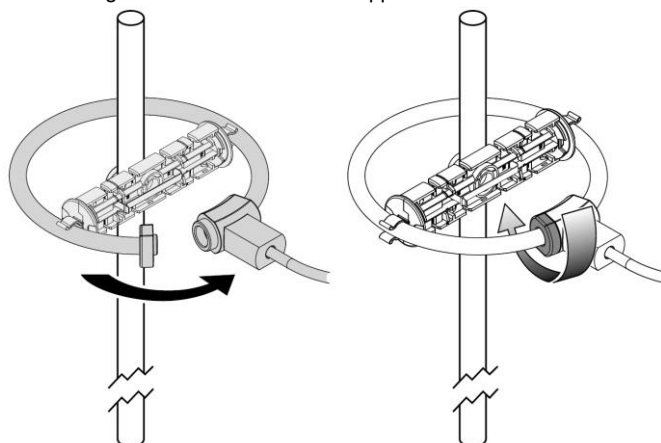
Note: Install the flexible Rogowski coils according to the direction indicated by the arrow moulded on the coil core.

4. PREPARATION – CONNECTION *(continued)*

Use of the centering supports *(continued)*:
. Rectangular bars with Cable tie Colring
fix the centering support with a Cable tie Colring - max. width 6 mm

H max. 6 mm

fix the Rogowski flexible coil to the support and close it.

Note: Install the flexible Rogowski coils according to the direction indicated by the arrow moulded on the coil core.

EMS BTDIN - Multifunction Measuring module with open Rogowski coils

4. PREPARATION – CONNECTION *(continued)*

Use of the centering supports *(continued)*:

. Rectangular bars with Bold and Nut

drill the bar and fix the centering support with M8 Bolt+Nut *(hole on the centering support: Ø = 8,5 mm)*
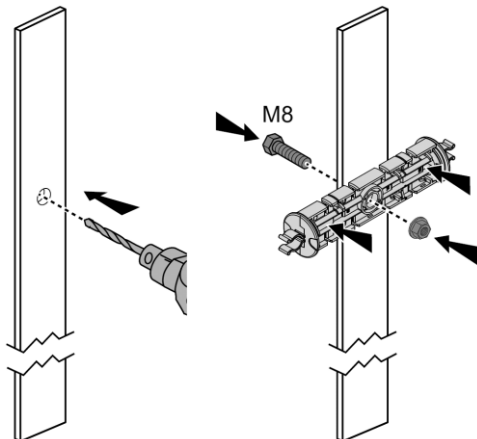
fix the Rogowski flexible coil to the support and close it.
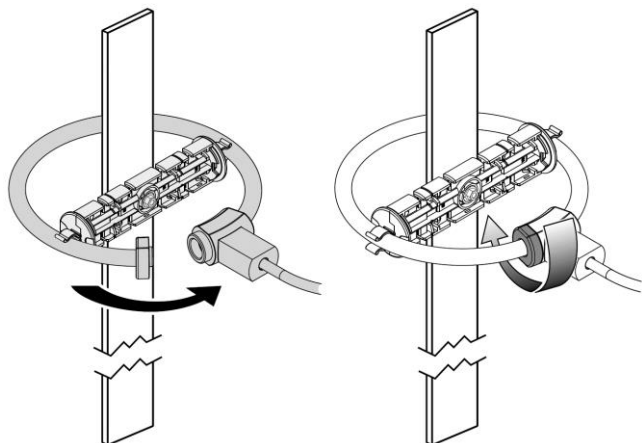
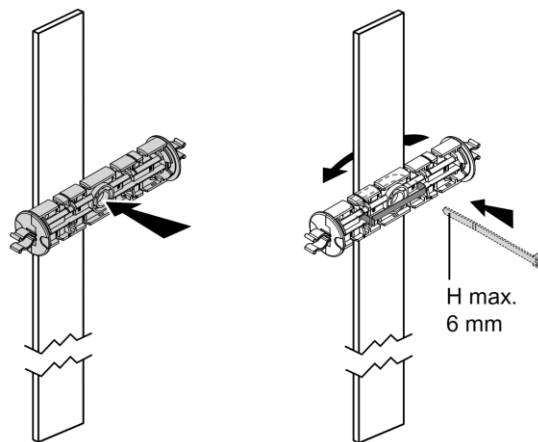**Note:** Install the flexible Rogowski coils according to the direction indicated by the arrow moulded on the coil core.
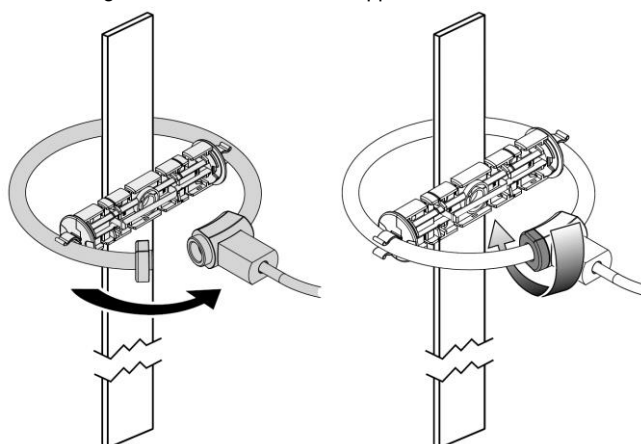
4. PREPARATION – CONNECTION *(continued)*

Use of the centering supports *(continued)*:

. "C" bars with Hammer nut M8

insert the Hammer nut in the "C" bar and fix the centering support with M8 nut *(hole on the centering support: Ø = 8,5 mm)*
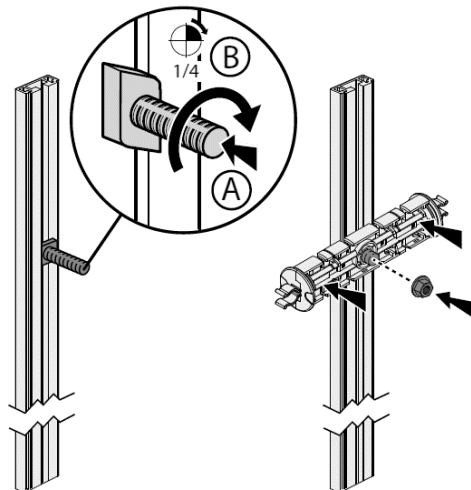
fix the Rogowski flexible coil to the support and close it.
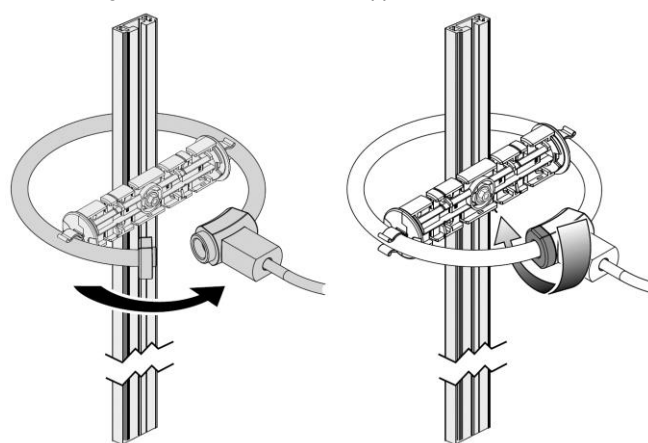
Note: Install the flexible Rogowski coils according to the direction indicated by the arrow moulded on the coil core.

Coil rotation on the support:

The lateral clips of the centering support can rotate up to 45° in one direction or the other in order to reduce the overall dimensions required by Rogowski's coil while still keeping it centred on the conductor.
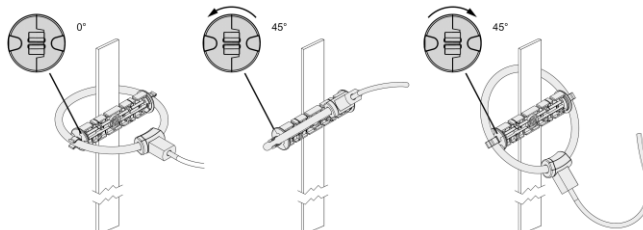
4. PREPARATION – CONNECTION *(continued)*

Module configuration:

. For these devices, following configurations are available:
current versus
insertion type (network with or without neutral conductor) [see § wiring diagrams]

Configurations are made by EMS BTDIN configuration software or by the EMS BTDIN mini configurator module (cat nos F80BV)

Data connection (EMS BTDIN modules inter-connection):

. Via specific communication patch cords (cat. nos F80BC250/ 500/1000)

Allow data transmission between the different EMS BTDIN modules. This type of connection is recommended when there are few EMS BTDIN modules, distributed all over the enclosure.
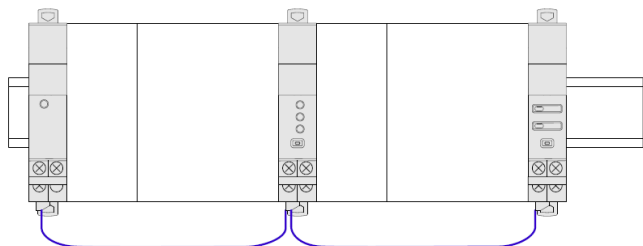

Implementing: with this configuration, the plastic protection cover of the backside communication ports on the EMS BTDIN module must be keep on.
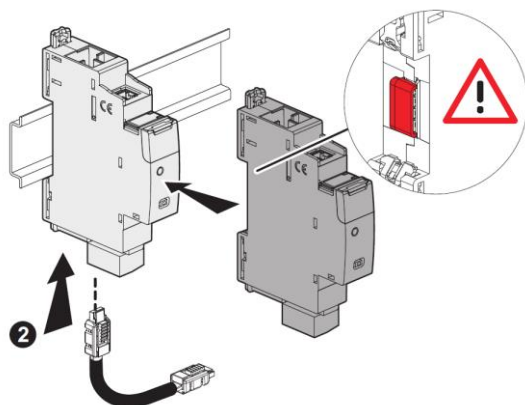
4. PREPARATION – CONNECTION *(continued)*

Data connection (EMS BTDIN modules inter-connection)

*(continued)***:**

. Via specific communication rails (cat. nos F80BR18/24/36).
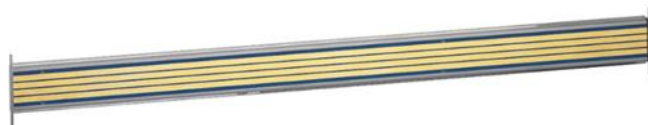
. Allow data transmission between the different EMS BTDIN modules.
This type of connection is recommended when there are several EMS BTDIN modules on the same DIN row.
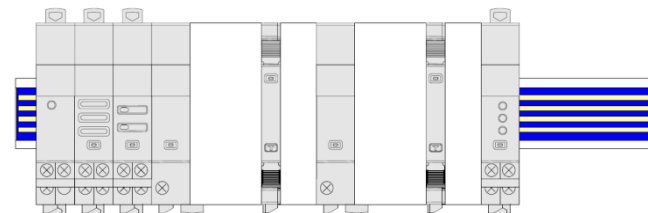
Implementing: with this configuration, the plastic protection cover of the backside communication ports on the EMS BTDIN module must be removed.
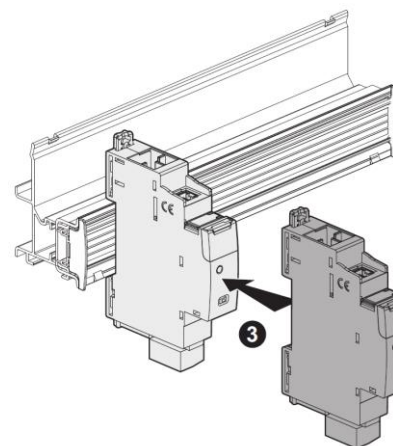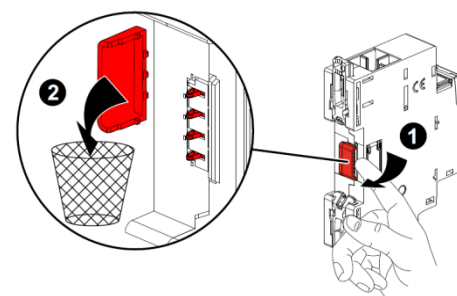
4. PREPARATION – CONNECTION *(continued)*

Data connection (EMS BTDIN modules inter-connection)

(continued):

. Via a mix between specific communication patch cords and communication rails in order to create a link between several rows

Two situations:

- Individually connected with communication rails.
  The communication patch cord allows to connect two rows.
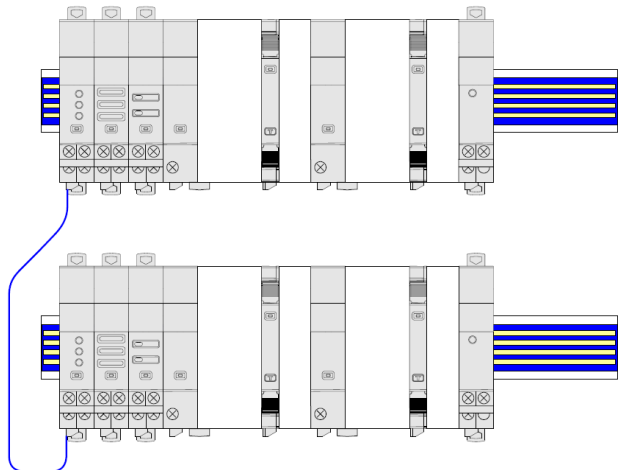
- Individually connected with communication patch cords & communication rail.
  The communication patch cords allow to connect EMS BTDIN modules on a row and to connect two rows.
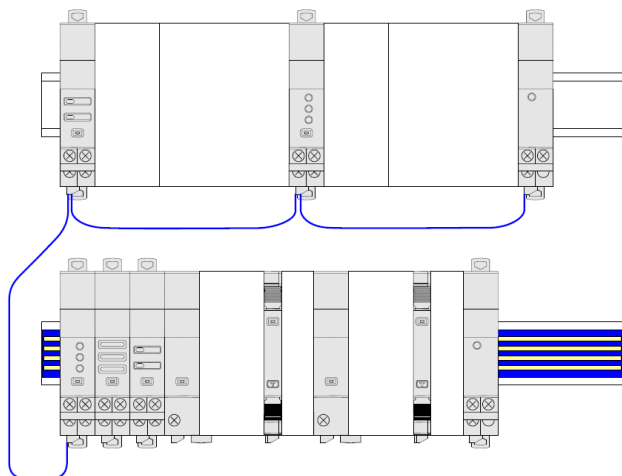
Labelling:

. Circuit identification by way of a label inserted in the label holder situated on the front of the product.
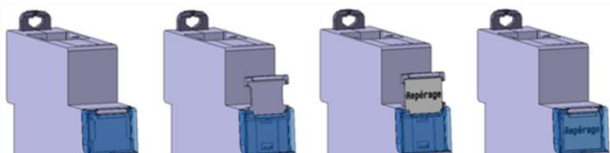
4. PREPARATION – CONNECTION *(continued)*

Position in a row:

. The product profile and the position of the terminals at the downstream allow the insertion of the prong-busbar by the upstream. In this way the position of the EMS BTDIN device in a row can be freely chosen
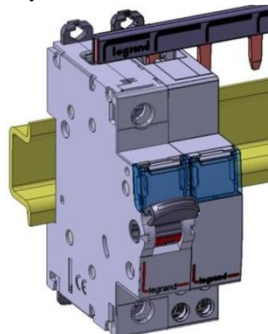

Module maintenance:

. A device may be replaced in the middle of a row supplied with prong-busbar without disconnecting the other devices.

1. Put the clamp in the unlocking position
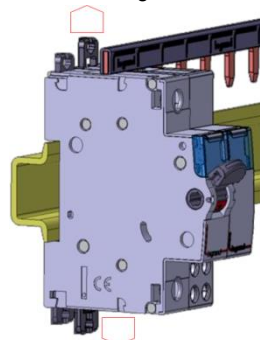
1. Put the clamp in the unlocking position
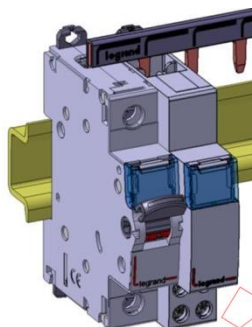
2. Pull the device forward in order to release it from the rail
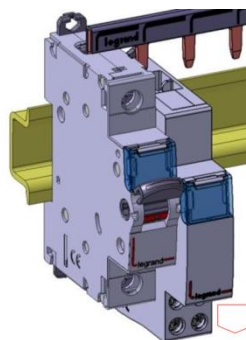
3. Pull the device downward in order to release it completely from the prongs of the busbar

5. GENERAL CHARACTERISTICS

Front face marking:

. By permanent ink pad printing (red line) and laser marking
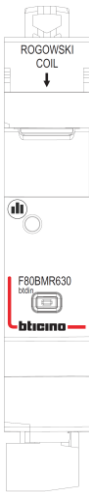
Lateral side marking:
. By laser.

left side: Standard and programming information

Standards

Indicates the presence of the addressing track-wheel

Legrand address
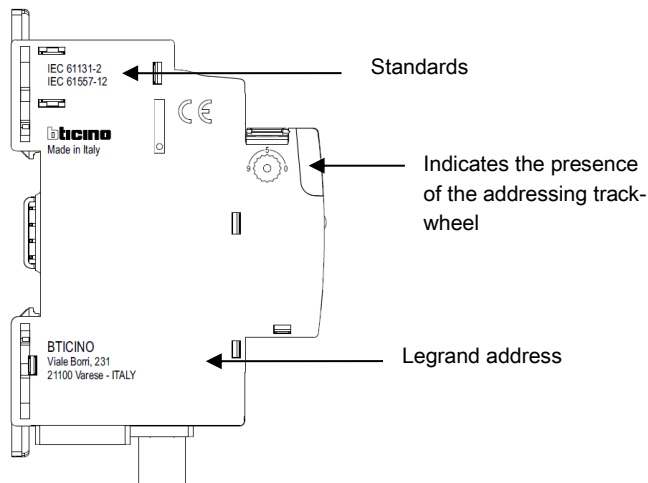
right side: cabling and traceability information

Electrical characteristics

Label: to be removed from the module and kept if necessary (module ID info ...)

Data connection with communication rail

Traceability information

Data connection with communication patch cords

Cabling information
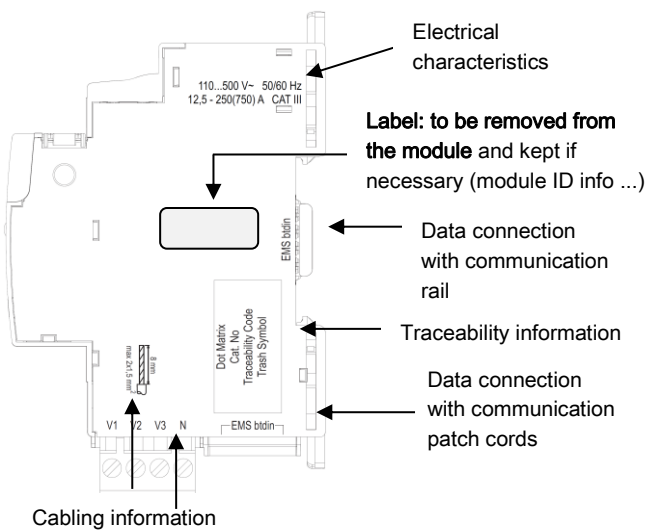
5. GENERAL CHARACTERISTICS *(continued)*

Voltage measurement terminal block marking:
. By permanent ink pad printing.

Voltages sequence
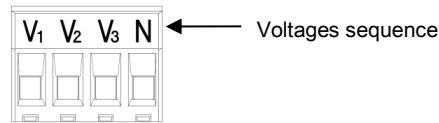
Measuring LED:
. The device is equipped with a measuring LED (red colour); it gives information that the device is counting an energy consumption:

Blinking red	
F80BMR630	10 Wh/imp.
F80BMR1600	25 Wh/imp.
F80BMR3200	50 Wh/imp.
F80BMR6300	100 Wh/imp.
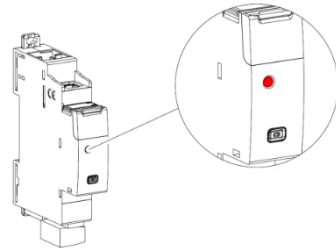
Multi-Functions button:
. Front face button as several functions:
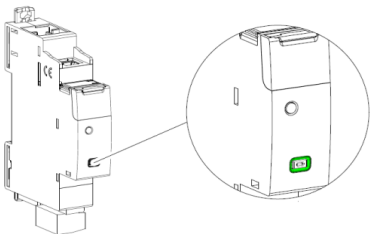
. Give information about the operating state on the module
Possible states:

Colour	State	Meaning
red	Slow blinking	Error (e.g. addressing error)
	Fast blinking	No function
	Steady *(pressing the multifunction button longer than 10 sec.)*	Total reset [any firmware updates are preserved]
green	Slow blinking	System process is running. Wait until the Led turns steady
	Fast blinking *(pressing the multifunction button for 5 sec.)*	put in "Stand-by" the EMS BTDIN module (no remote action and communication available)
	Steady	System OK, connection is running
orange	Slow blinking	Creation of a link with "Link Functionality" procedure *(see next §)*
	Fast blinking	Device's firmware update in progress
	Steady	No function
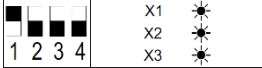
5. GENERAL CHARACTERISTICS *(continued)*

Link Functionality:

. This function allows you to link two EMS BTDIN modules to create automatic actions that, once programmed, can run independently without a connection to a manager is needed.

The basic rule is the link between an event (circuit breaker that trip, a threshold exceeded, etc.) and an action accordingly (signalling, opening of a circuit by motorized control or contactor, etc.).

Possible associations are:

Event generator	Command: F80BC	State + Command: F80BCS	State: F80BV
		Action module	
Measure: F80BM3M63, F80BMM63, F80BMT63, F80BMT125, F80BMT, F80BMR630, F80BMR1600, F80BMR3200, F80BMR6300	✓	✓	✓ Only with the module configured (locally or remotely) as shown:
State: F80BCR, F80BVS	✓	✓	✗ It's enough to configure the module (locally or remotely) as ″Slave″
State + Command: F80BCS	✓	✓	✗ It's enough to configure the module (locally or remotely) as ″Slave″

Note:

- association can only be of type 1 to 1 (1 event and 1 action).
- modules already associated cannot be used for other associations.
- all the configuring procedure will be done with the Configuration Software (available online for free). *[For more details refer to the Installation Manual of EMS BTDIN Configuration software]*

5. GENERAL CHARACTERISTICS *(continued)*

Modules compatible with "Link Functionality" feature: firmware versions and production date:

Cat n°	Firmware version	Production date indicated on the label sticked on the side of the module
F80BM3M63	all firmware versions	any production date
F80BMM63	ver. ≥ 2.0.1	date ≥18W25
F80BMT63	ver. ≥ 2.0.1	date ≥ 18W49
F80BMT125	all firmware versions	any production date
F80BMT	ver. ≥ 2.0.1	date ≥18W35
F80BMR630	all firmware versions	any production date
F80BMR1600	all firmware versions	any production date
F80BMR3200	all firmware versions	any production date
F80BMR6300	all firmware versions	any production date
F80BCR	ver. ≥ 2.0.1	date ≥18W47
F80BVS	ver. ≥ 2.0.2	date ≥18W35
F80BCS	ver. ≥ 2.0.6	date ≥18W45
F80BC	ver. ≥ 3.0.2	date ≥18W39
F80BV	ver. ≥ 2.0.4	date ≥18W38
F80BIM1	ver. ≥ 3.0.8	date ≥18W34

Measured quantities and Accuracy class:

. Current:
  phase: I_1, I_2, I_3 (accuracy 1)
  neutral: I_N. (accuracy 1)

. Voltage (accuracy 0,5):
  phase/phase: U_{12}, U_{23}, U_{31};
  phase/neutral: V_{1N}, V_{2N}, V_{3N}.

. Frequency (accuracy 0,1)

. Power:
  instantaneous active total and phase power (accuracy 1);
  instantaneous reactive total and phase power (accuracy 1);
  instantaneous apparent total and phase power (accuracy 1);

. Power factor a (accuracy 0,5).

. Energy:
  total and partial active energy, positive and negative
  (accuracy 1);
  total and partial reactive energy, positive and negative
  (accuracy 2).

. Harmonic analysis:
  Voltages: odd harmonics up to 15th (in display and via communication RS485);
  Currents: odd harmonics up to 15th (in display and via communication RS485);

Note: measurement accuracy is guaranteed only with the conductor correctly centred in each measuring sensor *(see § "Use of the centering support)*.

EMS BTDIN - Multifunction Measuring module with open Rogowski coils

5. GENERAL CHARACTERISTICS *(continued)*

Measuring sensors operating range:
. Max Rogowski primary current:
F80BMR630 = 750 A
F80BMR630 = 1950 A
F80BMR3200 = 3900 A
F80BMR6300 = 7500 A

Insulation voltage (at voltage measurement terminals):
. Ui = 500 V (Ph-Ph)

Impulse withstand voltage Uimp:
. EMS ports / Voltages input terminals:
wave 1,2 / 50 μs: 6 kV
alternate current 50 Hz / 1 min.: 3 kV

. EMS ports / Current sensors input terminal:
wave 1,2 / 50 μs: 6 kV
alternate current 50 Hz / 1 min.: 3 kV

Pollution degree:
. 2 according to IEC/EN 60898-1.

Overvoltage category:
. III

Dielectric strength:
. 2500 V

Plastic material:
. Self-extinguishing polycarbonate.
. Heat and fire resistant according to IEC/EN 60695-2-12, glow-wire test at 960°C.
. Classification UL 94 / IECEN 60695-11-10: V1

Ambient operating temperature:
. Min. = -25°C, Max. = +70°C

Ambient storage temperature:
. Min. = -40°C, Max. = +70°C

Protection Index:
. Protection index of terminals against direct contacts:
IP2X (IEC/EN 60529).
. Protection index of terminals against solid and liquid bodies (wired device): IP 20 (IEC/EN 60529).
. Protection index of the front face against solid and liquid bodies: IP 40 (IEC/EN 60529).
. Class II, front panel with faceplate.

Average weight per device:
. Weight inclusive of measuring sensors

	kg
F80BMKIT1	0,050
F80BMKIT3	0,130
F80BMR630	0,410
F80BMR1600	0,445
F80BMR3200	0,480
F80BMR6300	0,570

5. GENERAL CHARACTERISTICS *(continued)*

Volume when packed:

	dm³
F80BMKIT1 in bag of 1 kit (pack per 20 bags)	2,6
F80BMKIT3 in bag of 1 kit (pack per 6 bags)	2,6
F80BMR630, F80BMR1600	3,3
F80BMR3200, F80BMR6300	7,2

Consumption:
. Values at 12 VDC

	W	mA
F80BMR630	0,419	34,8
F80BMR1600	0,419	34,8
F80BMR3200	0,419	34,8
F80BMR6300	0,419	34,8

5. GENERAL CHARACTERISTICS *(continued)*

Load shedding Function:

. Allows to automatically carry out load shedding in case of power demand when a circuit exceeds a threshold.

. Function is implementable using together following EMS BTDIN modules:

- Universal Control module (cat. no F80BC) with DIP-switches on 0000 position *(see § "Module configuration")*

- Measurement modules (cat. nos F80BM3M63, F80BMM63, F80BMT63, F80BMT125, F80BMT, F80BMR630, F80BMR1600, F80BMR3200, F80BMR6300)

To set the different parameters it is necessary to use the EMS Configuration software (available online for free)

. Procedure:

1. Assign the same address to the EMS BTDIN modules (Universal control and Measurement modules) which require to be linked

2. Connect a computer to the Modbus/EMS BTDIN interface or to the Mini configuration module (according to the system architecture type; see § "System architectures")

3. In the EMS Configuration software pages adjust the parameters:

. In the dedicated page of the Measurement module:

- **Threshold**: value of Total active power (kW) above which procedure starts. *(default value 100 kW)*

- **Hysteresis**: value expressed in % of the threshold under which the alarm is over and the disconnected loads are restored. *(default value 5%, max value 100%)*

- **Alarm delay** (s) - *(default value 1 sec., max. value 30000 sec)*:

  during the activation of an alarm: is the waiting time between the threshold point and the alarm on the EMS bus

  during the de-activation of an alarm: is the waiting time between the hysteresis point and the alarm is deactivation on the EMS bus

. In the dedicated page of the Universal control module:

- **Relay normal state**: the rest position of the relay; normally open (NO) or normally closed (NC).

- **Relay activation:** impulsive or maintained

- **Relay activation time** (s): used for the impulsive work method only; represents the time in which the relay remains in the working position. *(default value 1 sec., max. value 6000 sec)*:

- **Activation delay** (s): waiting time between the alarm on the EMS bus and the action done by the universal control module *(default value 0 sec, max. value 6000 sec)*:
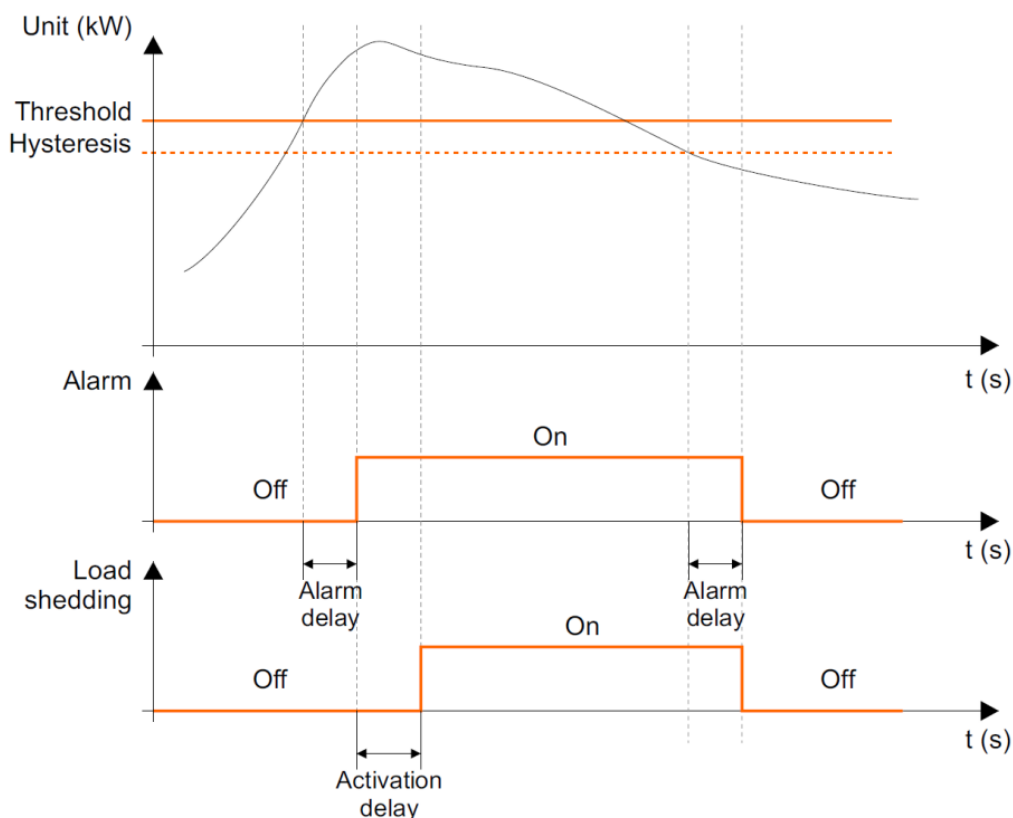
6. SYSTEM ARCHITECTURES

The EMS BTDIN is a polyvalent system and, according to the needs of the customer, can be set up and/or used as "Stand-alone" or "Supervised" system. Based on this choice the configuration and addressing methods are different.

Four possible architectures are provided:

6.1 Stand-alone system
6.1.1 with local addressing (through the track wheel)
6.1.2 with remote addressing (through a computer)

6.2 Supervised (Computer Supervisory System)
6.2.1 with local addressing
6.2.2 with remote addressing

6.1 Stand-alone system

. **Stand-alone** = autonomous system. To be used by the end-user if it is not necessary to have a computer for the supervision outside the envelope. Everything can be managed on site.

6.1.1 Stand-alone system with local addressing (through the track wheel)

Local addressing advantages:
- No configuration software needed to set-up the installation
- **It is not necessary to use a computer to manage settings** (configurations, test, ...) and to use the system (visualize and be alerted, ...). Everything can be done through the Mini configuration module (local display, cat. no F80BV). *[Refer to the technical sheet dedicated to this module for details]*.
- No communication Interfaces or gateways are required.
- Installation can be done without the intervention of a System Integrator

Programming procedure:

. For EMS BTDIN modules which need some: mandatory through the lateral DIP-switches of each EMS BTDIN module *(see § "Module configuration")*

Addressing procedure:

. For all EMS BTDIN modules: mandatory through the track wheel located on the top upper face of each EMS BTDIN modules
. Marked from 0 to 9 in order to locally define the Modbus address of the EMS BTDIN modules
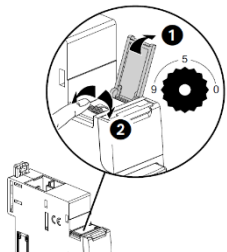
Note for Measure Module "3x single phase":
This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 12, Addresses of the module 12, 13, 14)

Consequences of the local addressing mode (through the track wheel):

. Each device of the system must be addressed.
. Addresses available: from 1 to 9
. Address 0 not permitted
. It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a signalling auxiliary module (cat. no F80BCR), a universal control module (cat. no F80BC), a measuring module, and so on. In this way on the EMS BTDIN mini configuration module (local display) the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the schemes hereunder]*
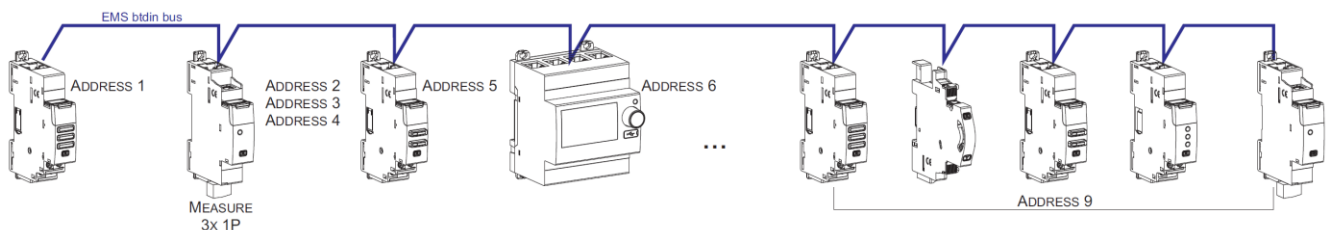
Note for the mini configuration module (local display)
. It is possible to assign it the same address as another EMS BTDIN through the programming menu of the device
. The mini configuration module can be placed everywhere in the EMS BTDIN bus

6. SYSTEM ARCHITECTURES

6.1 Stand-alone system *(continued)*

6.1.2 Stand-alone system with remote addressing (through a computer)

Remote addressing advantages:
- Whole configuration (addresses and functions) can be set up through the EMS Configuration software
- Configuration software available for free
- **Automatic detection of the EMS BTDIN modules** installed in the system (characteristics, functions, configuration...)
- **Increased settings possibilities: load shedding function**
- Increased addressing: **up to 30 Modbus addresses in a system**

Programming procedure:

. For EMS BTDIN modules which need some: mandatory through the lateral DIP-switches of each EMS BTDIN module or via the configuration software *(see § "Module configuration")*

Addressing procedure:

The track wheel must be left in position "0".

. It is not necessary to address the EMS BTDIN modules. **The track wheel must be left in default position "0".**
. All the addressing/configuring procedure will be done with the Configuration Software (available online for free)
. With remote addressing, the software does the automatic detection of modules installed in the system, but the supervision is not possible until the user assigns the remote address and all the characteristics to each module.

Note: it is mandatory to connect the computer to the mini configuration module with an USB-micro USB cable. *[For more details, refer to the technical data sheet of the Mini configuration module EMS BTDIN]*
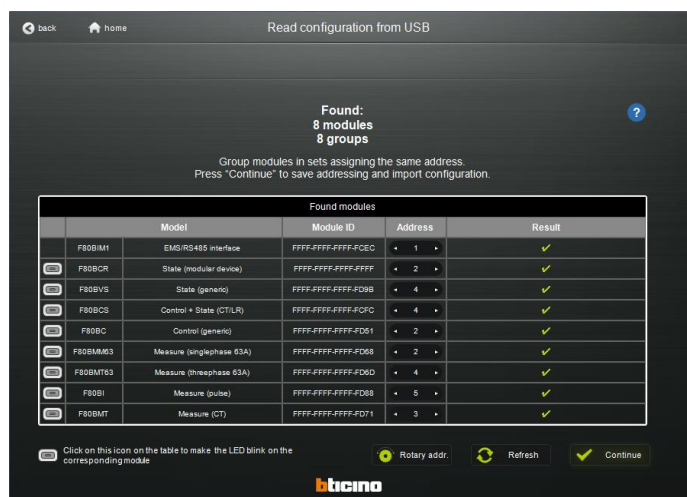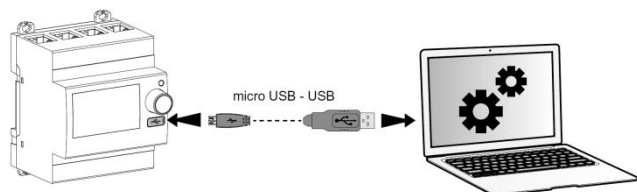

Note for Measure Module "3x single phase":

This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 2, Addresses of the module 2, 3, 4)

6. SYSTEM ARCHITECTURES

6.1 Stand-alone system *(continued)*:

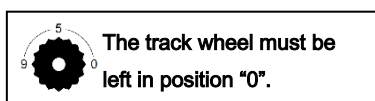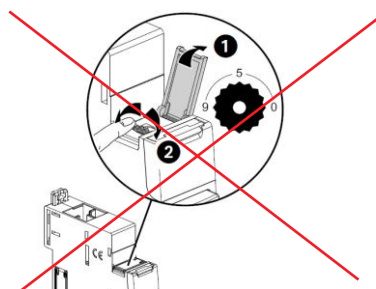#### 6.1.2 Stand-alone system with remote addressing (through a computer) *(continued)*:

Consequences for the system architecture:
- for 1 mini configuration module (cat. no F80BV)
  - up to **30 EMS BTDIN modules** (e.g. 30 devices grouped per functions with addresses from1 to 30)

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a signalling auxiliary module (cat. no F80BCR), a universal control module (cat. no F80BC), a measuring module, and so on. In this way on the EMS BTDIN display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the schemes here under]*

Note for the mini configuration module (local display)
. It is possible to assign it the same address as another EMS BTDIN
. The mini configuration module can be placed everywhere in the EMS BTDIN bus

6.2 Supervised system (Computer Supervisory System)
. **Supervised system** = System to be used through a Computer Supervisory System to remotely read data from the EMS BTDIN devices and/or do operations on these devices (e.g. commands of a motor driven or contactor ...).

6.2.1 Supervised system-with local addressing (through the track wheel)
Local addressing advantages:
- No configuration software needed to set-up the installation
- Installation can be done without the intervention of a System Integrator

Programming procedure:
. For EMS BTDIN modules which need some: mandatory through the lateral DIP-switches of each EMS BTDIN module *(see § "Module configuration")*
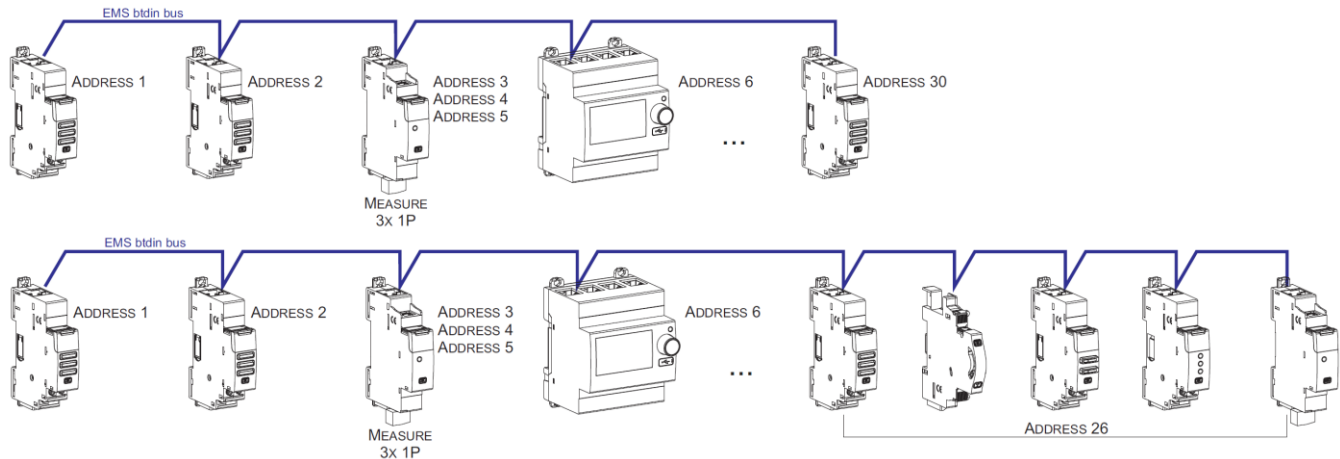
Addressing procedure:
. For all EMS BTDIN modules: mandatory through the track wheel located on the top upper face of each EMS BTDIN modules

. Marked from 0 to 9 in order to locally define the Modbus address to EMS BTDIN modules
In this system the Modbus address of an EMS BTDIN module device or group of modules (several functions) is obtained considering the address of the interface Modbus/EMS BTDIN Interface as tenth and the address of a device or group of function as unit (e.g. Interface address 1 = 10 → address of module n°5 = Modbus address 15)

Note for Measure Module "3x single phase":
This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 12, Addresses of the module 12, 13, 14)
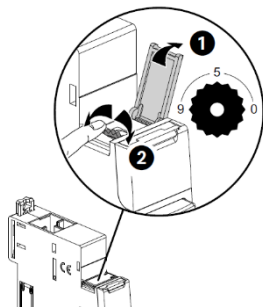
6. SYSTEM ARCHITECTURES *(continued)*

6.2 Supervised system (Computer Supervisory System) *(continued)*

6.2.1 Supervised system-with local addressing (through the track wheel) *(continued)*

Consequences of the local addressing mode (through the track wheel):

. Each device of the system must be addressed.

. Addresses available: from 1 to 9

. Address 0 not permitted

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a signalling auxiliary module (cat. no F80BCR), a universal control module (cat. no F80BC), a measuring module, and so on. In this way on the EMS BTDIN display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the scheme hereunder]*

Note: In this configuration the Modbus address of an EMS BTDIN module device or group of modules (several functions) is obtain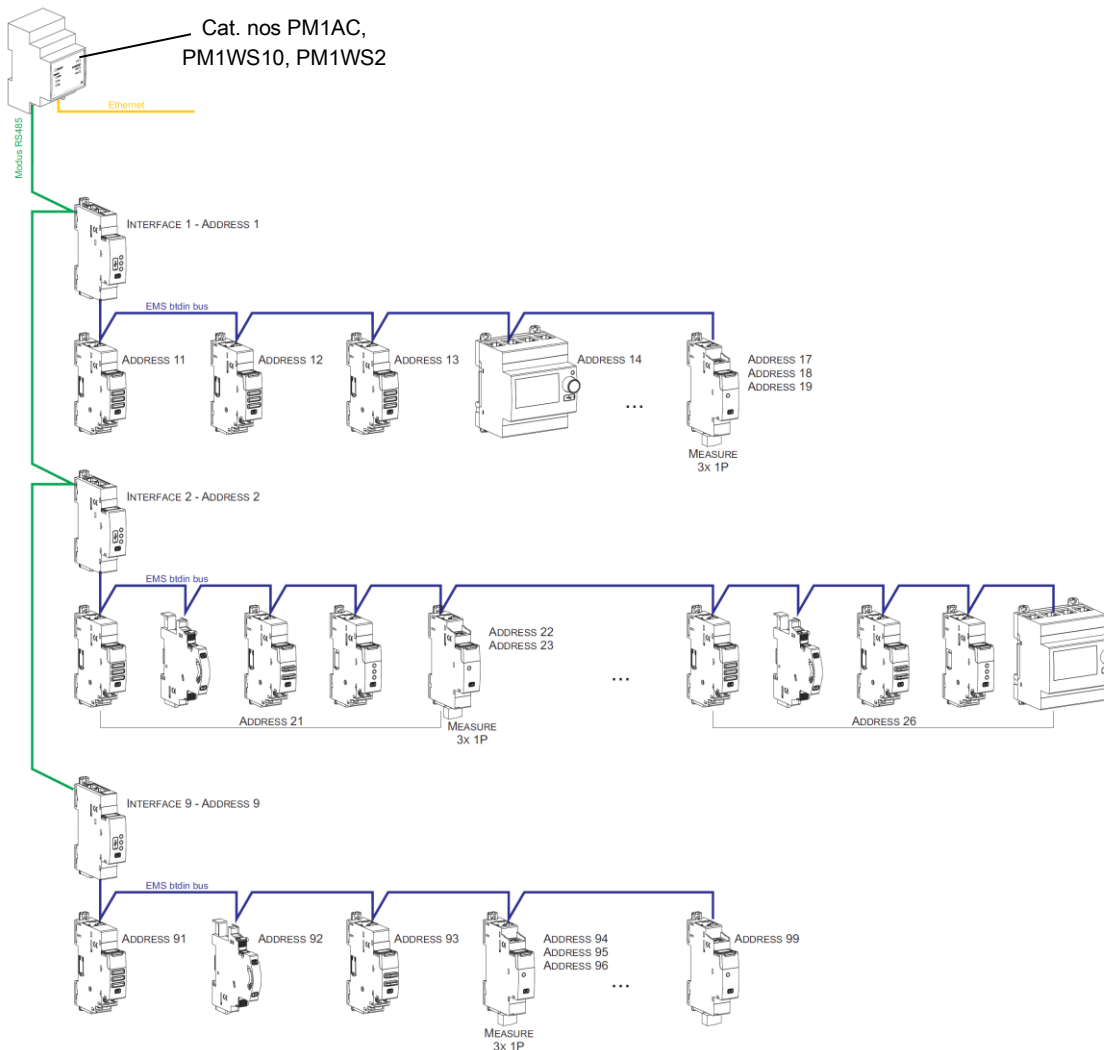ed considering the address of the interface Modbus/EMS BTDIN Interface as tenth and the address of a device or group of function as unit (e.g. Interface address 1 = 10 and device address = 5 → Modbus address = 15)

Consequences for the system architecture:

- for 1 IP/Modbus gateway (cat. no PM1AC):
    - o up to **81 Modbus address**
    - o mandatory limit of max. **9 Modbus/EMS BTDIN interfaces or max. 1000 m of Modbus cable** (cable Belden 9842, Belden 3106A or equivalent) or max. **50 m of Category 6 cable** (FTP or UTP).
- for 1 Modbus/EMS BTDIN Interface (cat. no F80BIM1):
    - o up to **30 EMS BTDIN modules** (ex. 30 devices grouped per functions with addresses from1 to 9)

Note: with local addressing, the Modbus/EMS BTDIN interface, does the automatic detection of modules (characteristics, functions, configuration...)

Product information: IDP000278EN_02   Updated: 01/04/2021   Created: 30/09/2020   **bticino**

6. SYSTEM ARCHITECTURES *(continued)*

6.2 Supervised system (Computer Supervisory System) *(continued)*

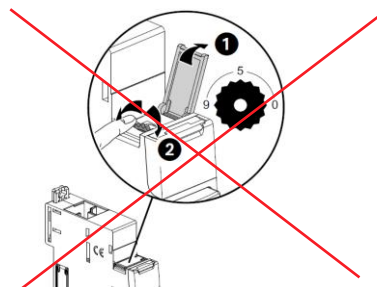### 6.2.2 Supervised system-with remote addressing (through a computer)

Remote addressing advantages:
- Whole of configuration (addresses and functions) can be done a remotely through the EMS Configuration software
- Configuration software available for free
- **Automatic detection of the EMS BTDIN modules** installed in the system (characteristics, functions, configuration...)
- **Increased settings possibilities: load shedding function**
- Increased addressing: **up to 32 Modbus/EMS BTDIN interfaces**
- Increased addressing: **up to 247 Modbus addresses in a system**

Programming procedure:
. For EMS BTDIN modules which need some: mandatory through the lateral DIP-switches of each EMS BTDIN module or via the configuration software *(see § "Module configuration")*

Addressing procedure:
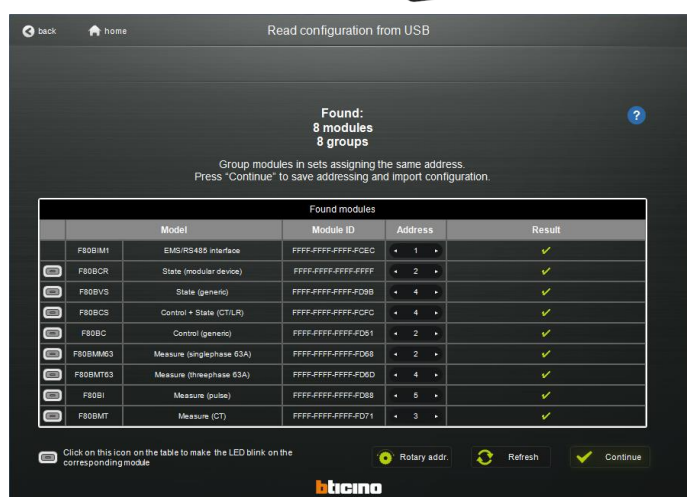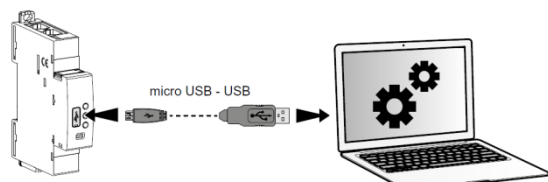

The track wheel must be left in position "0".

. It is not necessary to address the EMS BTDIN modules. **The track wheel must be left in default position "0".**
. All the addressing/configuring procedure will be done with the Configuration Software (available online for free)
. With remote addressing, the software does the automatic detection of modules installed in the system, but the supervision is not possible until the user assigns the remote address and all the characteristics to each module.
Note: it is mandatory to connect the computer to the different Modbus/EMS BTDIN interface with an USB-micro USB cable (one interface at a time). *[For more details, refer to the technical data sheet of the Modbus/EMS BTDIN interface]*

micro USB - USB

Read configuration from USB

Found:
8 modules
8 groups

Group modules in sets assigning the same address.
Press "Continue" to save addressing and import configuration.

	Model	Module ID	Address	Result
F80BIM1	EMS/RS485 interface	FFFF-FFFF-FFFF-FCEC	1	✔
F80BCR	State (modular device)	FFFF-FFFF-FFFF-FFFF	2	✔
F80BVS	State (generic)	FFFF-FFFF-FFFF-FD9B	4	✔
F80BCS	Control + State (CT/LR)	FFFF-FFFF-FFFF-FCFC	4	✔
F80BC	Control (generic)	FFFF-FFFF-FFFF-FD51	2	✔
F80BMM63	Measure (singlephase 63A)	FFFF-FFFF-FFFF-FD68	2	✔
F80BMT63	Measure (threephase 63A)	FFFF-FFFF-FFFF-FD6D	4	✔
F80BI	Measure (pulse)	FFFF-FFFF-FFFF-FD88	5	✔
F80BMT	Measure (CT)	FFFF-FFFF-FFFF-FD71	3	✔

Click on this icon on the table to make the LED blink on the corresponding module

Rotary addr.   Refresh   Continue

Note for Measure Module "3x single phase":
This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 2, Addresses of the module 2, 3, 4)
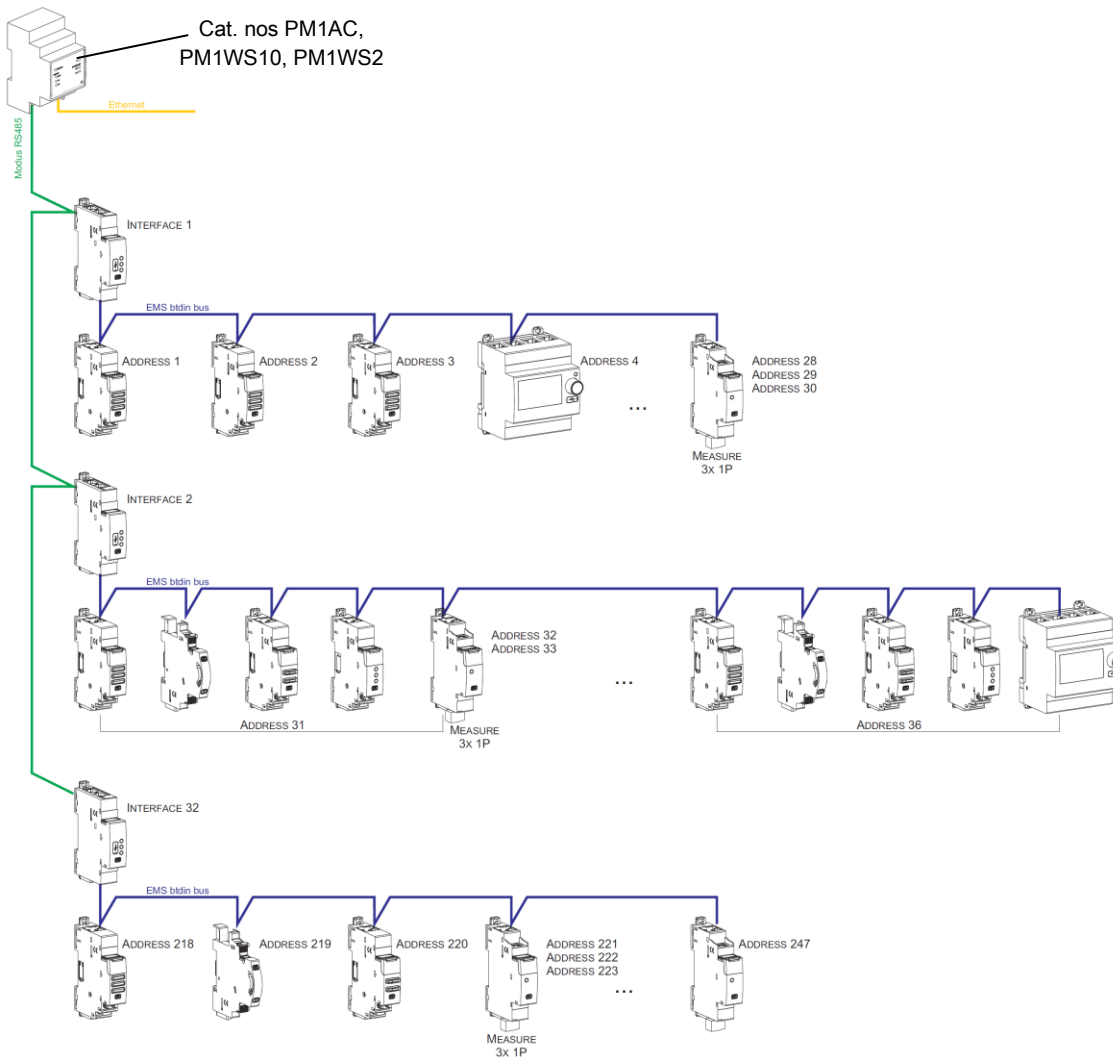
6. SYSTEM ARCHITECTURES *(continued)*

6.2 Supervised system (Computer Supervisory System) *(continued)*

6.2.2 Supervised system-with remote addressing (through a computer) *(continued)*

Consequences for the system architecture:

- for 1 IP/Modbus gateway (cat. no PM1AC):
  - o up to **247 Modbus address**
  - o Because of Modbus: mandatory limit of max. **32 Modbus/EMS BTDIN interfaces** or max. **1000 m of Modbus cable** (cable Belden 9842, Belden 3106A or equivalent) or max. **50 m of Category 6 cable** (FTP or UTP).
- for1 Modbus/EMS BTDIN Interface (cat. no F80BIM1):
  - o up to **30 EMS BTDIN modules** (e.g. 30 devices grouped per functions with addresses from1 to 30)

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a signalling auxiliary module (cat. no F80BCR), a universal control module (cat. no F80BC), a measuring module, and so on. In this way on the EMS BTDIN display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the scheme up here]*

7. COMPLIANCE AND APPROVALS

Compliance to standards:

. Compliance with Directive on electromagnetic compatibility (EMC) n° 2014/30/EU

. Compliance with low voltage directive n° 2014/35/EU.

. Electromagnetic Compatibility:

  emission according IEC/EN 61326-1, class B

  immunity according IEC/EN 61326-1.

Conformity table to IEC 61557-12 Edition 2 (2018/10/22)

Performance measuring and monitoring devices (PMD) characteristics		
Type of characteristic	Specification values	Other complementary characteristics
Classification of PMD according 4.4	PMD-x (*)	-
Classification of PMD according 4.4	DD	-
Temperature	K55	-
Humidity + Altitude	Standard conditions	-
Active power and Active energy function performance class	1	-

(*) PMD-III without Eap

7. COMPLIANCE AND APPROVALS *(continued)*

Conformity table to IEC 61557-12 Edition 2 (2018/10/22) *(continued)*

Function symbols	Function performance class according to IEC 61557-12	Measuring range	Other complementary characteristics
P	1	12,5 ÷ 750 A (F80BMR630) 32,5 ÷ 1950 A (F80BMR1600) 65,0 ÷ 3900 A (F80BMR3200) 125,0 ÷ 7500 A (F80BMR6300)	-
Q_V	1		-
S_A	1		-
E_a	1	12,5 ÷ 750 A (F80BMR630) 32,5 ÷ 1950 A (F80BMR1600) 65,0 ÷ 3900 A (F80BMR3200) 125,0 ÷ 7500 A (F80BMR6300)	-
E_{rV}	2		-
E_{apA}, E_{apV}	-	-	-
f	0,1	45 ÷ 65 Hz	-
I	0,1	12,5 ÷ 750 A (F80BMR630) 32,5 ÷ 1950 A (F80BMR1600) 65,0 ÷ 3900 A (F80BMR3200) 125,0 ÷ 7500 A (F80BMR6300)	-
I_{Nc}	1		-
U	0,5	110 ÷ 500 V (Ph-Ph)	-
P_{FA}	0,5	Over 360 degrees	-
U_{dip}	-	-	-
U_{swl}	-	-	-
U_{tr}	-	-	-
U_{int}	-	-	-
U_{nba}		-	-
U_{nb}	-	-	-
V_h	2	65 ÷ 290 V (Ph-N) 110 ÷ 500 V (Ph-Ph)	-
THD_u, THD_v	1		-
THD-R_u	-	-	-
I_h	5	63 ÷ 750 A (F80BMR630) 160 ÷ 1950 A (F80BMR1600) 320 ÷ 3900 A (F80BMR3200) 630 ÷ 7500 A (F80BMR6300)	-
THD_I	1		-
THD-R_I	-	-	-
P_{st}	-	-	-
P_{lt}	-	-	-

7. COMPLIANCE AND APPROVALS *(continued)*

Environment respect - Compliance with EU directives:

. Compliance with Directive 2011/65/EU as amended by Directive 2015/863 (RoHS 2) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
. Compliance with REACH regulation (1907/2006): at the date of the publication of this document no element of the SVHC substance list (updated on 27/06/2018) is present in these products.
. WEEE directive (2012/19/EU): the sale of this product is subject to a contribution to eco-organisations in each country responsible for managing end-of-life products in the field of application of the European Waste Electronic and Electrical Equipment Directive.

Plastic materials:

. Halogens-free plastic materials.
. Marking of parts according to ISO 11469 and ISO 1043.

Packaging:

. Design and manufacture of packaging compliant to decree 98-638 of the 20/07/98 and also to directive 94/62/CE.

Environmental profile:

. PEP document available