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ASSOCIATED WITH 240-  
56030406 RMU SPECIFICATION  
REVISION 2**

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## Information

Technical clarifications related to 240-56030406 revision 2: Specification for Ring Main Units (RMUs) for systems with nominal voltages from 3.3 kV to 33 kV, are detailed below to address short comings identified with 240-56030406 and to ensure clarity regarding certain requirements.

The requirements for remote tripping of switching devices (via a hand-held push-button remote control facility) and safety interlocking of MV cable earth are stated in 240-56030406 revision 2. Standardization of the Hand Held Push Button Remote Controller (HHPBRC) and how the DC supply is provided for control circuits (control of switching devices and the earth interlock functionality) is required to ensure interoperability of the RMU's from different OEMs related to the HHPBRC etc. As the HHPBRC and earth interlock will be used on all MV equipment fitted with RMUs i.e. free standing RMUs, free standing RMUs fitted with RTUs, mini subs and Bulk Metering Units (BMUs), the philosophy detailed below will apply throughout.

This TB aims to clarify the philosophy of operation and detail the Plug-In connectors to be used, their pin and wiring configuration (HHPBRC) for all RMUs, to ensure interoperability between various MV equipment fitted with RMUs from various OEM's.

## Revision history

Date	Rev	Compiler	Remarks
Nov 2021	1	P. Almeida	First issue.

## 1. Design Clarifications

### 1.1 Requirements for auxiliary DC and hand held push button remote control facility

Eskom Specification for RMUs: 240-56030406 revision 2, requires application of the VDS to interlock the MV cable earth to block application of the cable earth if the MV cable is "Alive"; such "safety Interlock" requires a reliable DC supply; hence the requirement to supplying the RMU with a dedicated auxiliary DC supply in addition to the HHPBRC for remote control operating. The following details the requirements for the auxiliary DC supply and HHPBRC, where these are required per schedule A.

- The auxiliary DC supply required to power the RMU control circuits i.e. Open / Close operation of the primary switches, spring charging (per 3.4 Remote Tripping in 240-56030406) and the safety Interlock circuits (VDS to interlock MV cable earth per 3.15 Live circuit Indication in 240-56030406), shall be supplied from a dedicated 24 V<sub>DC</sub> Portable "battery pack" via 1 dedicated plug-in connector on the RMU (DC only). The DC plug-in connector socket shall be wired to a suitably rated miniature circuit breaker (MCB for circuit protection) with the DC plug-in connector socket & MCB located together on the RMU in an easily accessible position on the front of the RMU, thereby supplying a "common DC" for all control circuits on the RMU as a unit (24 V<sub>DC</sub> bus wired to all RMU bays). The 24 V<sub>DC</sub> Portable "battery pack" shall be supplied with 4m umbilical cable terminated to the required plug-in connector- per Table:1, and shall include an integrated battery charger with battery status indication
- As the HHPBRC is used to perform the remote Close / Open operations of the primary switching devices (MV- Circuit breakers / Isolators), each switching device's plug-in connector socket (for coupling of the HHPBRC), shall have the female receptacle / socket located on the front of the RMU in an easily accessible position and labelled according to its associated primary switch device, to enable connection of the HHPBRC plug-in connector to execute the Close/ Open control operation of the associated switch device. The specification for the HHPBRC should be same as that defined at 3.5 e) "Stand-Off Hand Held Remote Control Unit for Switching of Circuit breakers" in 240-56065131 rev 3- The Dx and Tx specification for 6.6 kV to 33 kV withdrawable Indoor metal-enclosed switchgear Standard, to ensure interoperability thereof.

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Two different model types of ITT cannon plug-in connectors are detailed ( housings), to ensure differentiation between the connectors based on their application function i.e. control = Bayonet housing versus aux DC= MS Screw housing, to prevent incorrect coupling related to function.

Table 1 Details the specific model of ITT cannon plug-in connectors required (Panel Socket / Plug), the pin wiring etc. per the application function (Control / aux DC).



**Table 1: Details of plug-in connectors required for HHPBRC and auxiliary DC supply**

Function	Panel Mount -Socket	HHPBC Pendant / Aux DC -Plug	Pin Wiring	Type of Plug –In connector Housing	Umbilical Cable length
HHPBRC: Open/ Close Controls. 1 socket per primary switch device.	CA- 3102_A_14S-2_S	CA- 3106_E_14S-2_P	Trip: C & D Close: A & B	Bayonet	20m
DC Supply: 1 Socket for the RMU	MS -3102_A_14S-2_P	MS- 3106_A_14S-2_S	+DC – A -DC - C	MS Screw	4m

## 1.2 Plug-in connectors detailed

Table 2 and 3 show the type of ITT cannon plug-in connectors related to their application function. The two different types of cannon plug-in connectors ( housings) were selected to prevent incorrect coupling.

**Table 2: Summary of ITT Cannon Plug-in connectors required for HHPBRC**

Panel Mounted Sockets	Plug Housing
HHPBC: Open/ Close controls. One socket per switching device (Circuit Breaker –B or Isolator -R)	
CA- 3102_A_14S-2_S	Bayonet Type Plug-In connector CA- 3106_E_14S-2_P
	

**Table 3: Summary of ITT Cannon Plug-in connector required for the auxiliary DC supply**

Panel Mounted Sockets	Plug Housing
DC Supply: 1 Socket for the RMU unit	
Panel Mount Socket MS -3102_A_14S-2_P	MS Screw Type Plug-In connector MS- 3106_A_14S-2_S
	

## 2. Amendments to be noted, relating to 240-56030406 revision 2: Specification for Ring Main Units (RMUs) for systems with nominal voltages from 3.3 kV to 33 kV are detailed below per clause

- 1) 3.4 a) Remote Tripping: Indicates provision for the remote operations of earthing. This requirement for remote operating of earth switch devices is to be ignored, as this is not presently required.
- 2) 3.4 b) Remote Tripping: Where the requirement for “the male coupler shall be provided and positioned on the front of the RMU”, this is revised to “the Female receptacle / socket shall be provided and positioned on the front of the RMU”. This change is required so that the HHPBRC detailed for RMU's is the same as that defined in clause 3.5 e) “Stand-Off Hand Held Remote Control Unit for Switching of Circuit breakers” in 240-56065131 rev 3 The Dx and Tx Specification for 6.6 kV to 33 kV withdrawable Indoor metal-enclosed switchgear Standard, to ensure interoperability of the HHPBRC and the Stand-Off Hand Held Remote Control Unit's.
- 3) 3.4.c) Remote Tripping & 3.25 Accessories : Indicates “HHPBRC with portable battery tripping unit (BTU)”, implied a single device incorporating the Aux DC supply and HHPBRC, however as detailed in 1.1 of this document, the HHPBRC and the Aux DC supply (24V Battery) are essentially separate devices.
- 4) 3.15 Live Circuit Indication: Where the VDS is utilised for safety interlocking it is stated “include the functionality to enable interlocking for blocking of any earth switch closing operation or circuit breaker open or close function, when the MV cable compartment is alive”- a correction is required here, as the interlocking blocking requirement is only applicable to earth switch closing, and is Not applicable to circuit breaker open or close functions.