Motor control and protection unit
M10x ordering guide

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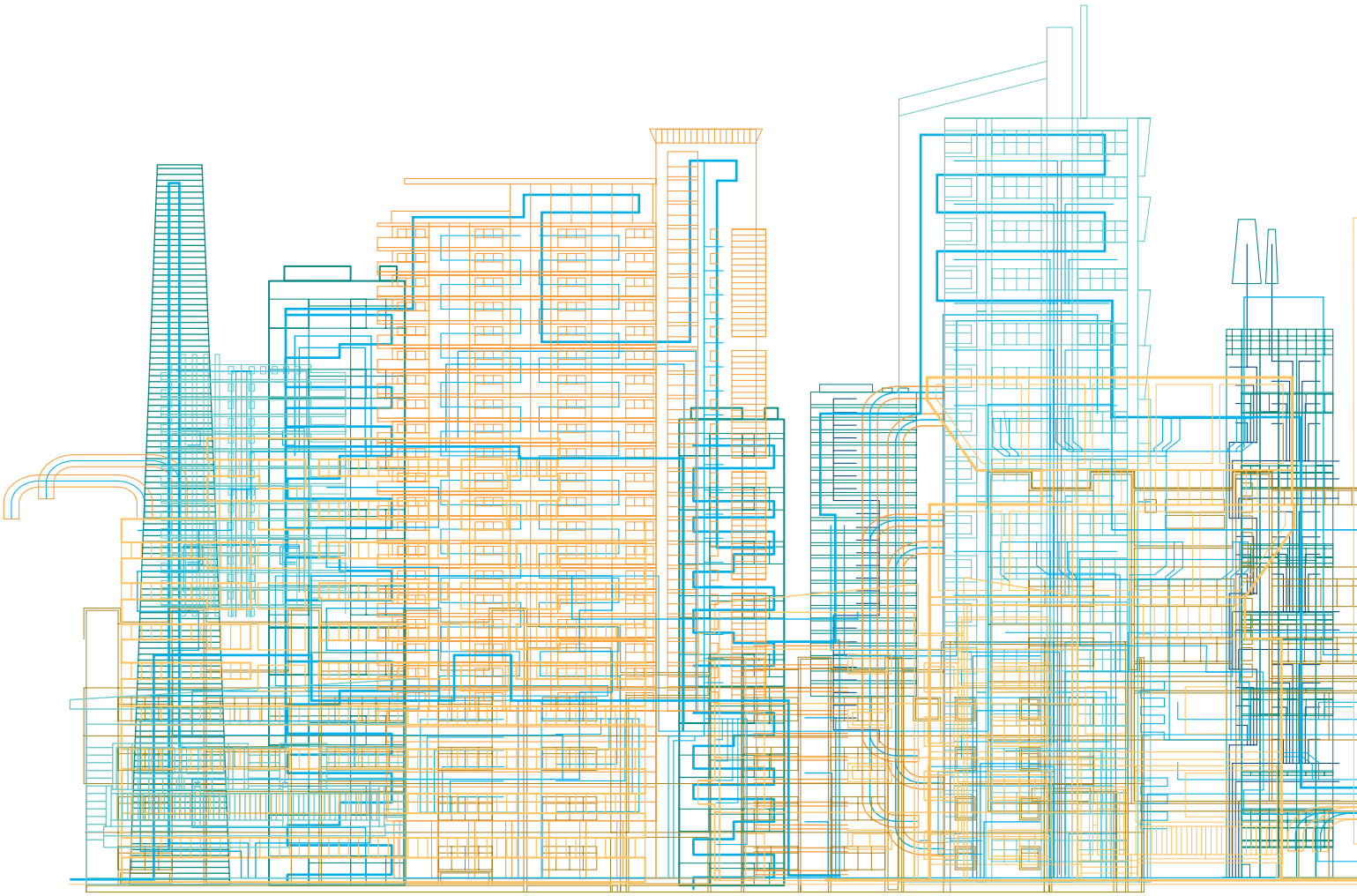

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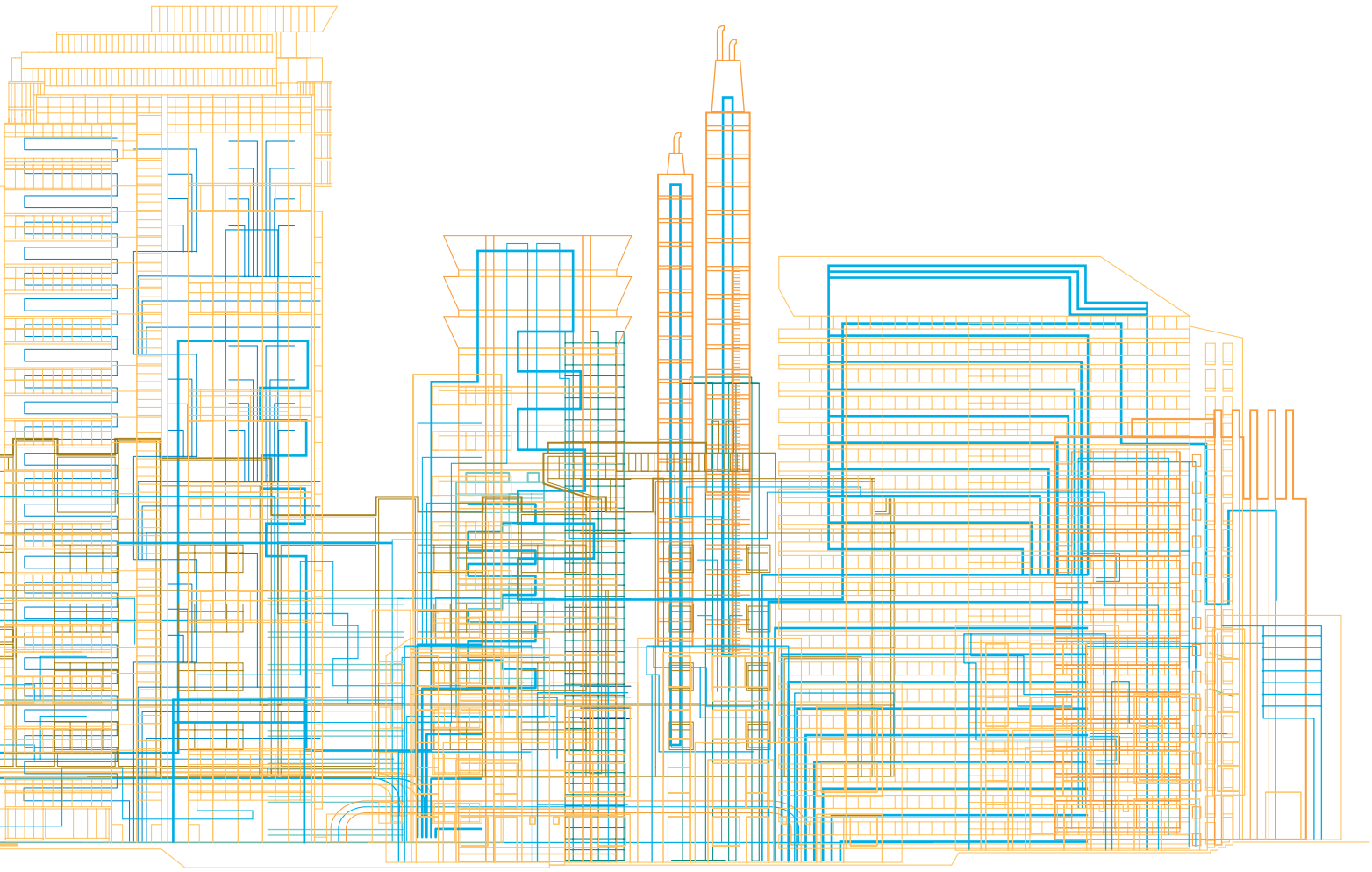


General

Target group

This document provides the ordering information for M10x and its accessories.

Use of warning, caution, information and tip icon

This publication includes Warning, Caution, and Information icons where appropriate to point out safety related or other important information. It also includes Tip icons to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:

	The electrical warning icon indicates the presence of a hazard that could result in electrical shock.
	The warning icon indicates the presence of a hazard that could result in personal injury.
	The caution icon indicates important information or warnings related to the concept discussed in the text. It might indicate the presence of hazard that could result on corruption of software or damage to equipment/property.
	The information icon alerts the reader to pertinent facts and conditions.
	The tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although Warning notices are related to personal injury, and Caution notices are associated with equipment or property damage, it should be understood that the operation of damaged equipment could, under certain operational conditions, result in impaired process performance leading to personal injury or death. It is, therefore, imperative that you comply fully with all Warning and Caution notices.

Terminology

List of terms, acronyms, abbreviations and definitions used in the document:

Abbreviation	Term	Description
	Modbus	Fieldbus communication protocol
	MODBUS RTU	Fieldbus communication protocol
	PROFIBUS-DP	Fieldbus communication protocol with cyclic data transfer (V0).
	PROFIBUS-DP/V1	Fieldbus communication protocol, extension of PROFIBUS-DP allowing acyclic data transfer and multi master (V1).
RCU	Remote control unit	Local control unit with pushbutton and indicator to operate a device (eg, motor) from field level.
RS485		Communication interface standard from EIA (Electronics Industries Association, USA), operating on voltages between 0V and +5V. RS-485 is more noise resistant than RS-232C, handles data transmission over longer distances, and can drive more receivers.

Related documentation

1TNC911112D0205 M10x User Guide
1TNC920201D0201 M10x AO Module User Guide

Related software version

The content of this document is related to the following hardware version releases:

	HW
M10x-M 24VDC	2.0
M10x-M 110VAC	1.0
M10x-M 240VAC	1.0
M10x-P 24VDC	3.2
M10x-P 110VAC	1.0
M10x-P 240VAC	5.2
MD21 & MD31	1.0
AO11	1.0

This document applies to future firmware versions until further notice.

The described functions are designed but may not be fully implemented in all details. Please refer to the current system guides and release notes regarding possible restrictions.

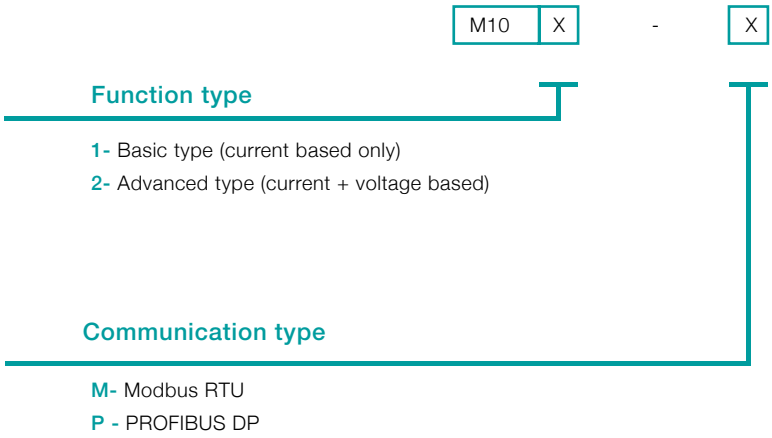
Document revision history

Revision	Description of change	Date
M0201	First Issue	05/2004
M0202	M101 added	06/2005
M0203	Template Changed as per BU Guideline	10/2010
M0204	Released for M10x products with new hardware	01/2013
M0205	Released for new external CT	07/2013
M0206	Released for AO11	07/2015

Type designation

M10x is an intelligent motor control and protection device based on current and voltage measurement and maintenance data monitoring and offers users superior protection, control and monitoring. M10x is available with options for serial communication.

Each type designation is represented by a hardware type. M101 offers basic motor control and protection function based on current measurement. M102 provides advanced functions for motor protection and control based on current and voltage measurement. When selecting a device, the user must know what function and protocol type is required to select the appropriate hardware type.



Note 1) M10x-P supports both DP V0 and DP V1.
2) There are three different types of power supply for each type of product, ie, 24VDC, 110VAC and 240VAC.

Main hardware components

The main hardware components of M10x motor control center, including M101, M102 units, operator panel and connection cables, are provided with individually assigned identification number to indicate their hardware status. Components can have different firmware status within one and the same hardware version. Unless marked out clearly in the purchasing order, components are delivered with the latest release firmware identified on their labels.

In order to assure that the ordered components match with each other, please make sure the ID numbers of the components are written clearly and correctly in your phasing order.

M10x basic: M101

Main unit

Main unit is constructed with two parts: the electronics of the motor control unit and the integrated CT. Main unit is a one type device with the integrated CT range starting from 0.24 to 63A. For motor rating larger than 63A, interposing CTs are selected.

Main unit is designed with a mounting rail fixed to the bottom of the device for easy DIN rail mounting. In case of vertical mounting, screw mounting accessories are also provided.

M101 main unit covers current based protection functions and other basic control features.

Power Supply

24VDC, 110VAC or 240VAC types of power supply are available.

Digital Inputs

24VDC, 110VAC or 240VAC types of DIs are provided according to power supply type.

Description/picture	Spec/purpose	ID number
Motor protection and control unit: M101 	M101 to be used for drive types as follows: NR_DOL, direct online NR_DOL/RCU, direct online with RCU REV_DOL, reversing direct online REV_DOL/RCU Contactor feeder Contactor feeder/RCU Feeder No voltage related functions provided in M101! M101 is be chosen dependent on: ▪ Bus type ▪ the voltage of digital inputs 24VDC,110VAC or 230VAC	
M101-M 	M101-M connection using MODBUS RTU	
	M101-M 0.24 – 63A 24VDC	1TNA920611R0001
	M101-M 0.24 – 63A 110VAC	1TNA920622R0001
	M101-M 0.24 – 63A 240VAC	1TNA920633R0001
M101-P 	M101-P connection using PROFIBUS DPV0 and DPV1	
	M101-P 0.24 – 63A 24VDC	1TNA920711R0001
	M101-P 0.24 – 63A 110VAC	1TNA920722R0001
	M101-P 0.24 – 63A 240VAC	1TNA920733R0001

M10x advanced: M102

Main unit

Main unit is constructed with two parts: the electronics of the motor control unit and the integrated CT. Main unit is a one type device with the integrated CT range starting from 0.24 to 63A. For motor rating larger than 63A, interposing CTs are selected.

Main unit is designed with a mounting rail fixed to the bottom of the device for easy DIN rail mounting. In case of vertical mounting, screw mounting accessories are also provided.

M102 main unit covers both current based and voltage based protection functions and all basic and advanced control features.

Power supply

24VDC, 110VAC or 240VAC types of power supply are available.

Digital inputs

24VDC, 110VAC or 240VAC types of DIs are provided according to the power supply type.

Description/picture	Spec/purpose	ID number
Motor protection and control unit: M102 	M102 to be used for drive types as follows: NR_DOL, direct online NR_DOL/RCU, direct online with RCU REV_DOL, reversing direct online REV_DOL/RCU Actuator, actuator with limit switch input NR_S/D, non reversing star-delta NR_2N, Two speed driver with separate windings NR_2N Dahlander, two-speed driver with single winding Autotransformer NR_softstarter REV_softstarter Feeder Contactor feeder Contactor feeder/RCU Parameter monitoring and protection functions related to voltage measurement are provided with M102 only. M102 is chosen dependent on: ▪ Bus type ▪ the voltage of digital inputs 24VDC,110VAC or 230VAC	
M102-M 	M102-M connection using MODBUS RTU	
	M102-M 0.24 – 63A 24VDC	1TNA920611R0002
	M102-M 0.24 – 63A 110VAC	1TNA920622R0002
	M102-M 0.24 – 63A 240VAC	1TNA920633R0002

M102-P 	M102-P connection using PROFIBUS DPV0 and DPV1	
	M102-P 0.24 – 63A 24VDC	1TNA920711R0002
	M102-P 0.24 – 63A 110VAC	1TNA920722R0002
	M102-P 0.24 – 63A 240VAC	1TNA920733R0002

Operator panel

The operator panel MD21/MD31 is the user interface mounted on the module front or door, used for local monitoring, control and parameterization.

Each M10x is required to be equipped with one operator panel which provides a mini USB-port for parameterization.

The operator panel contains control buttons, navigation buttons, LED indicators and LCD display.

Description/picture	Spec/purpose	ID number
Operator panel MD21 	M101-M, M101-P, M102-M and M102-P accessory, functions as described in previous paragraph. MD21 provides both LED indicators and LCD display	1TNA920500R0002
Operator panel MD31 	MD31 provides LED indicators only.	1TNA920500R0001

MDx connection cable

The cable is used for connections among MD, AO11 and M10x unit.

Description/picture	Spec/purpose	ID number
	TA201 The cable length is 1.2m with a RJ11 connector integrated on each cable end.	1TNA920005R2101
	TA202 The cable length is 2.5m with a RJ11 connector integrated on each cable end.	1TNA911005R2104
	TA204 The Cable length is 0.2m with a RJ11 connector integrated on each cable end.	1TNA920005R2106

Order numbers for M10x kits

Each kit contains M10x, operator panel MD21 or MD31, connection cable TA201.

Description		ID number
M101-M with MD21 (24VDC)	Including: M101-M 24VDC (1TNA920611R0001) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920611R2001
M101-M with MD21 (110VAC)	Including: M101-M 110VAC (1TNA920622R0001) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920622R2001
M101-M with MD21 (240VAC)	Including: M101-M 240VAC (1TNA920633R0001) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920633R2001
M101-P with MD21 (24VDC)	Including: M101-P 24VDC (1TNA920711R0001) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920711R2001
M101-P with MD21 (110VAC)	Including: M101-P 110VAC (1TNA920722R0001) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920722R2001
M101-P with MD21 (240VAC)	Including: M101-P 240VAC (1TNA920733R0001) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920733R2001

Description		ID number
M102-M with MD21 (24VDC)	Including: M102-M 24VDC (1TNA920611R0002) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920611R2002
M102-M with MD21 (110VAC)	Including: M102-M 110VAC (1TNA920622R0002) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920622R2002
M102-M with MD21 (240VAC)	Including: M102-M 240VAC (1TNA920633R0002) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920633R2002
M102-P with MD21 (24VDC)	Including: M102-P 24VDC (1TNA920711R0002) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101	1TNA920711R2002
M102-P with MD21 (110VAC)	Including: M102-P 110VAC (1TNA920722R0002) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920722R2002
M102-P with MD21 (240VAC)	Including: M102-P 240VAC (1TNA920733R0002) MD21 (1TNA920500R0002) TA201 (1TNA920005R2101)	1TNA920733R2002
M101-M with MD31 (24VDC)	Including: M101-M 24VDC (1TNA920611R0001) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920611R3001
M101-M with MD31 (110VAC)	Including: M101-M 110VAC (1TNA920622R0001) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920622R3001
M101-M with MD31 (240VAC)	Including: M101-M 240VAC (1TNA920633R0001) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920633R3001
M101-P with MD31 (24VDC)	Including: M101-P 24VDC (1TNA920711R0001) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920711R3001
M101-P with MD31 (110VAC)	Including: M101-P 110VAC (1TNA920722R0001) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920722R3001

Description		ID number
M101-P with MD31 (240VAC)	Including: M101-P 240VAC (1TNA920733R0001) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920733R3001
M102-M with MD31 (24VDC)	Including: M102-M 24VDC (1TNA920611R0002) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920611R3002
M102-M with MD31 (110VAC)	Including: M102-M 110VAC (1TNA920622R0002) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920622R3002
M102-M with MD31 (240VAC)	Including: M102-M 240VAC (1TNA920633R0002) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920633R3002
M102-P with MD31 (24VDC)	Including: M102-P 24VDC (1TNA920711R0002) MD31 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920711R3002
M102-P with MD31 (110VAC)	Including: M102-P 110VAC (1TNA920722R0002) MD21 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920722R3002
M102-P with MD31 (240VAC)	Including: M102-P 240VAC (1TNA920733R0002) MD21 (1TNA920500R0001) TA201 (1TNA920005R2101)	1TNA920733R3002

Options

Residual current transformer

M10x supports earth fault measurement through residual current transformer (RCT).

Description/picture	Spec/purpose	IDnumber
RCT 	There are two RCT current ratings of measurement available, ie, 1A, 5A. With four types of window size, ABB LNG series RCTs with different specs are listed as follows: The secondary outputs (to connect with M10x) are 1V.	1TNA911005R...
	LNG35 1A Measuring rating 1A, closed type, window with 35 mm diameter	1TNA911005R1001
	LNG35 5A Measuring rating 5A, closed type, window with 35 mm diameter	1TNA911005R1002
	LNG70 1A Measuring rating 1A, closed type, window with 70 mm diameter	1TNA911005R1003
	LNG70 5A Measuring rating 5A, closed type, window with 70 mm diameter	1TNA911005R1004
	LNG105 1A Measuring rating 1A, closed type, window with 105 mm diameter	1TNA911005R1005
	LNG105 5A Measuring rating 5A, closed type, window with 105 mm diameter	1TNA911005R1006
	LNG185 1A Measuring rating 1A, closed type, window with 185 mm diameter	1TNA911005R1007
	LNG185 5A Measuring rating 5A, closed type, window with 185 mm diameter	1TNA911005R1008

External CTs

The current measurement of M10x is based on the dedicated motor protection current transformer. The overload multiple of the current transformer must be more than 8 times.

M10x units for motors rating over than 63A, requires external protection CT to transform current into the measuring range of the integrated CT of M10x with which the current is measured for protection and monitor.

Description/picture	Spec/purpose	ID number
External CT 	There are three types external CT in three different dimensions.	1TNA602002R000.
	PCT3L200/5R Secondary output rating 5A	1TNA602002R0001
	PCT4L300/5R Secondary output rating 5A	1TNA602002R0002
	PCT5L500/5R Secondary output rating 5A	1TNA602002R0003

Should other CT ratings are required, please contact ISC China.

Analog Output Module

M10x support 1 channel 0-20mA or 4-20mA analog output through extended module AO11.

Description/picture	Spec/purpose	ID number
	AO11 24VDC supply, TA204 cable included	1TNA920511R0001
	AO11 110-240VAC 110-240VAC supply, TA204 cable included	1TNA920521R0001
	TA204 Connection cable between AO11 and M10x	1TNA920005R2106

Cables for parameterization

Description/picture	Spec/purpose	ID number
	TK201 Converter kit for parametering Used for connections between MDx and service PC The cable kit includes: ▪ The parametering cable of 2.5m length with one USB connector and one mini USB connector to connect MD21/MD31 to service laptop. ▪ CD contains driver programs and manuals ▪ Interface converter cable, mini USB to USB, compatible with MD2/MD3 connector	1TNA920005R2102

Accessory

Description/picture	Spec/purpose	ID number
Label Paper	Label paper for MD21/MD31 LED Size A4, 36 labels for MD21/MD31 LED	1TNA920005R2105
Mini USB cover 	TA207 Mini USB cover of Operation panel MDx1, 10 pieces	1TNA920005R2107

Parameterization software

M10x uses dedicated parameterization software, MCUSetup, to assist downloading and updating parameters into the units.

MCUSetup software runs on:
PC with Windows 2000, Windows XP, Windows 7 or Windows 8

Description/picture	Spec/purpose	ID number
	PS201 MCUSetup software includes the parameterization software for M10x, operator's manual, parameter description, MCUSetup user manual and GSD files.	1TNA920100R0001

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