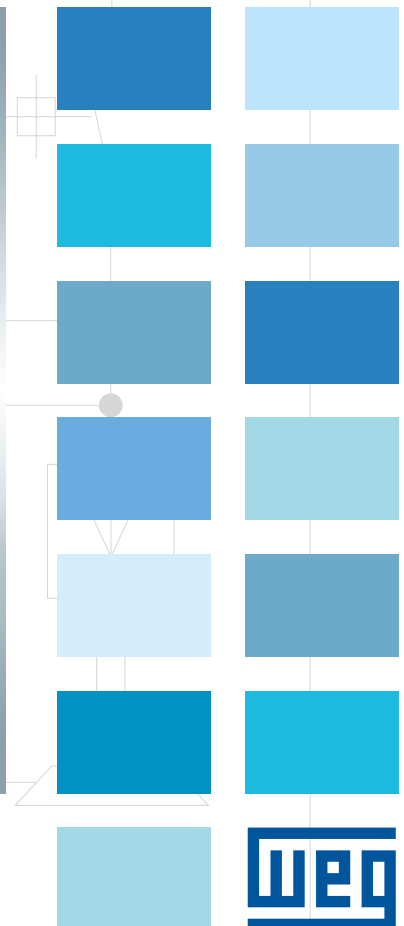
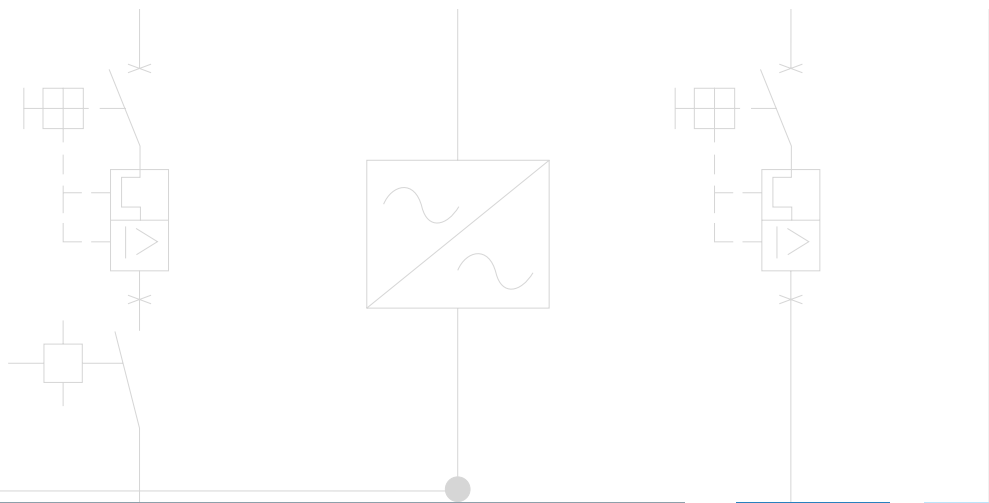


CCM03

Low Voltage Motor Control Center



WEG Low Voltage Motor Control Center

Designed with aim in a high level of standardization, a modular construction allows efficient space utilization and simplifies future expansions or modifications, besides providing easy assembling, installation, maintenance and interchangeability of control units of the same size and function.

Certified according IEC60439-1 - TTA/PTTA and coordination type 1 and 2, according IEC60947, WEG MCCs ensure high operation and maintenance reliability. Also designed according to brazilian safety standard NR10.

There are available two different MCC models:

Conventional MCCs - consists by vertical compartmentalized sections with fixed or withdrawable drawers.

Intelligent MCCs - present the same characteristics of the conventional MCCs. However, each control unit has an intelligent device, like soft-starters, variable frequency drives and microprocessed relays (with support to fieldbus communication network), which allows access to control and monitoring systems.



Technical Characteristics

Electrical	Model	MCC-03
	Cable entry/exit	Bottom ¹⁾
	Voltage class	690 V
	Frequency	50/60 Hz
	Rated current	Horizontal power busbar - up to 3,150 A ¹⁾ Vertical power busbar: 630 A and 800 A
	Short circuit current (1s-symmetrical)	50 kA and 80 kA (CEPEL Certified)
	Ambient temperature	40 °C ¹⁾
	Temperature rise	According to IEC60439-1
	Maximum altitude	2,000 m ¹⁾
	Protection degree	IP42 ¹⁾
Mechanical	Installation	Indoor
	Steel sheet thickness	Structure: 12 MSG Other parts: 14 MSG
	Surface treatment	External parts: phosphatizing Internal parts: zinc-plated process Busbars: tin-plated process
	Painting	Doors, roof and side: light gray RAL 7032 epoxy powder painting Structure and baseboard: dark gray RAL 7022 epoxy powder painting
	Section dimensions	Height: 2,300 mm Width: 750 mm Depth: 600 mm
	Wireway dimensions	Height: 1,760 mm Width: 250 mm Depth: 600 mm
	Constructive form	3b and 4b

Note: 1) Others under request.

Construction Details

- Front-side access to units and compartments
- Handles, meters, pushbuttons, pilot lights and control switches are mounted on the door for easy readability and convenient access. Those devices that do not require immediate access are mounted inside the compartment
- There are 5 different sizes of withdrawable units, which can be specified according to the equipment, type of starter, motor rating or load characteristics
- Front-side access to wireways and terminal blocks compartments
- Bottom or top cables entrance is available



Withdrawable drawer details (GW-16)

The maximum number of units (same size) within one section are:

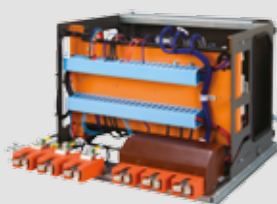
Fixed drawer	Withdrawable drawer	Max. units (per column)	Drawer height (mm)
GWF-16	GWE-16	11	160
GWF-24	GWE-24	6	240
GWF-32	GWE-32	5	320
GWF-48	GWE-48	3	480
GWF-64	GWE-64	2	640
GWF-80	-	2	800
GWF-96	-	1	960
GWF-112	-	1	1,120
GWF-128	-	1	1,280
GWF-144	-	1	1,440
GWF-160	-	1	1,600
GWF-176	-	1	1,760



Internal section view with all drawers removed

Standards

WEG MCCs are according to IEC60439-1, VDE0660 P-5 and NR10 (electrical installations and services). The Profibus-DP fieldbus communication network is according to EN50170.



Drawer details



Interlock

Each MCC unit can be operated in three different modes:

- **Inserted/Connected (I):** In this operation mode the power terminal block and the control circuit are connected to the busbar and the units are ready to run.
- **Test (T):** In this operation mode the power terminal block is disconnected from the busbar, however the control circuit is energized and ready to be tested. This operation mode is useful when the control source is the same for the whole MCC.
- **Extracted/Disconnected (E):** In this operation mode the power terminal block and the control circuit are disconnected from the busbar and the units can be removed from the MCC.

The disconnect operating handle (circuit breaker or disconnecting switch) is integrally mounted on the unit and mechanically interlocked, so that the door cannot be opened with the disconnect ON.

The disconnect operating handle may be padlocked in the OFF position with up to 3 pad-locks.

A special system guarantees the perfect electrical grip

between the unit stabs and the vertical busbar. Besides, this system allows a smoothly insertion/withdrawal of the unit, independently of the applied force.

The main busbar is located at the top of the structure for easy installation, inspection, and maintenance without having to remove units.

The vertical busbar is located on the rear part of each section, shrouded by a metallic duct reduce the possibility of accidental contact with those parts. The vertical busbar is connected to the horizontal busbar at top of each vertical section.

The ground busbar is horizontally assembled and located at the bottom of the structure.

When neutral busbar is required, it must be located together with the earth busbar compartment.

Thermal vision inspection for the stab contact is possible through specially designed apertures.

Automatic shutters cover the vertical busbar connection in the unit compartment when the unit is withdrawn to avoid accidental contact with the busbar.

Rear MCC View



Vertical busbar shrouded by the metallic conduit and outputs connectors

Drawer Removal Device Details

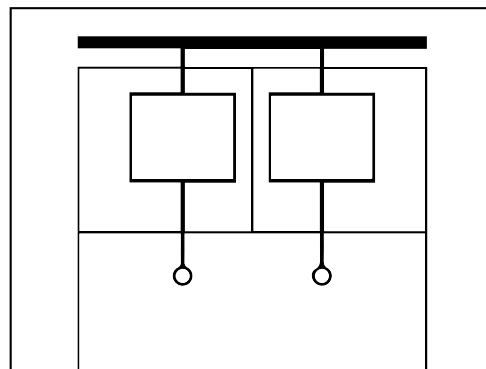


3b Constructive Form

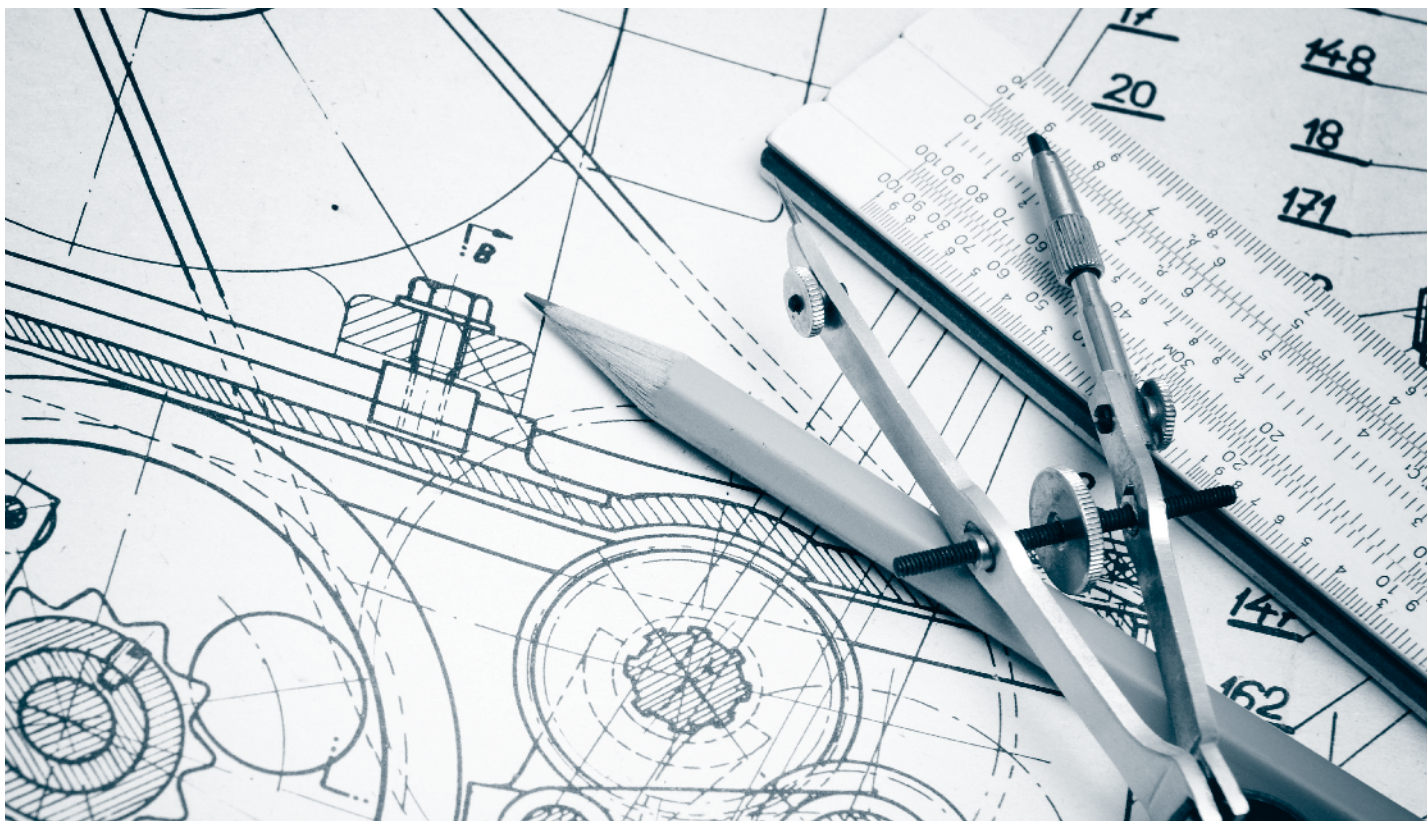
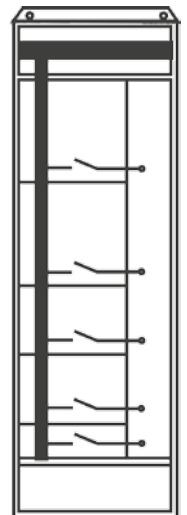
- Separation of busbars from all functional units.
- Separation of all functional units from one another.
- Separation of terminals for external conductors from the functional units, but not from those of other functional units.
- The power cable connections are disposed in the same compartment.
- Maintenance services require extra care, as placed in the same compartment the connections of other units might be powered.



Frontal view



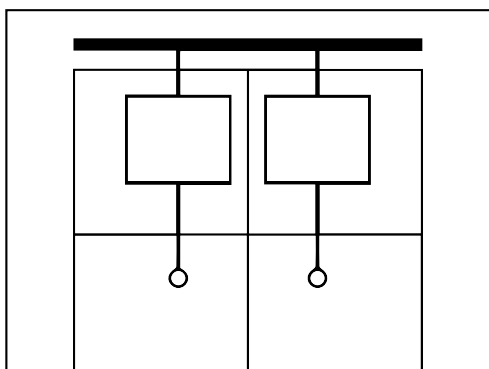
Form 3b: terminal not separated from the busbar



4b Constructive Form

Looking for enhanced security in relation to operation, maintenance and handling, WEG developed MCC-03 / MCC-03i in 4b constructive form, according to IEC60439.

- Separation of busbars from all functional units.
- Separation of all functional units from one another.
- In the 4b construction, the rear access is necessary (cables connection in the rear part).
- Rear doors are split into two, reducing the necessary access space, increasing the walkway / escape area in case of emergency.
- The power cables connection are placed in the same compartment (terminal block and cables compartment), however there are individual protections against accidental touch.
- Maintenance serves are totally safe, because other powered units will have their connections protected.



Form 4b: outgoing terminals not in the same compartment as associated functional unit



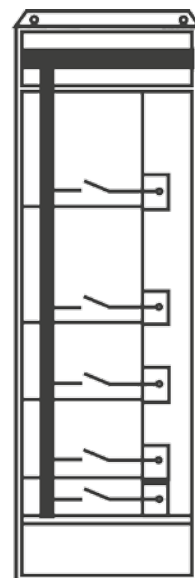
Individual plexiglas protection covers, with openings to allow thermal camera inspection



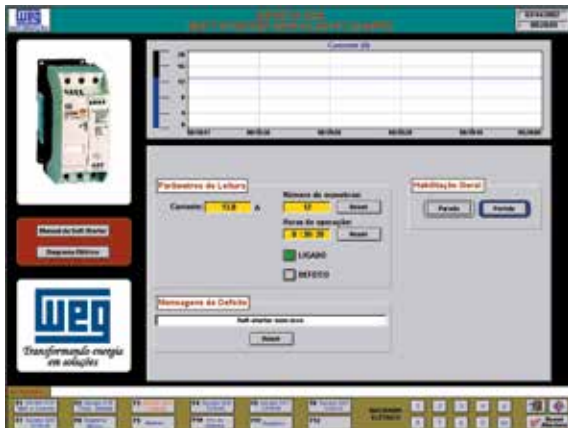
Rear cover opening just if the drawer is extracted



Vertical busbar protected by metallic cover, with openings to allow thermal camera inspection



Intelligent MCC



The intelligent MCCs are composed by motor starters (soft-starters, variable frequency drives or microprocessed relays), designated as the slaves, and by a Programmable Controller installed in the same or in an adjacent MCC, designated as the master. In this architecture the PLC (master) controls and monitors all MCC devices (slaves). Information regarding MCC devices is available through local/remote Human-Machine Interfaces or PCs (supervisory system).

From the HMI you can:

- Control the motor starter.
- Read unit status from units (Inserted/Test).
- Read motor data, including the total elapsed motor running time, number of starts, and the number of overload trips, last errors.

From the PC (supervisory) you have the same options for the HMI plus:

- Statistical functions, fault recorder.
- Reports, history and trend graphics.

Smart Relay SRW01

The SRW01 is a low voltage, electric motor management system with state-of-the-art technology and network communication capabilities. Additionally, its modular concept allows it to be used in various applications. The modular design provides greater expansion of the relay functions.

The SRW01 communicates with three different networks:

- Profibus-DP V1
- DeviceNet
- Modbus-RTU

Another innovative characteristic is the HMI (Human-Machine Interface), which allows easy monitoring and configuration of the relay.



SuperDrive Programming Software

SuperDrive is a Windows® based software used for WEG's drives parameterization, control and monitoring via PC.

The communication may be performed using RS232, when using point-to-point communication (one PC directly connected to one drive), or by RS485, when using a network communication (one PC connected up to 30 drives).

SRW01 Technical Characteristics

Assembly position	Any
Degree of protection (IEC60529)	-
UC - Control Unit	IP20
Current measurement	-
Without connection busbar	IP20
With connection busbar	IP00
Human Machine Interface (HMI)	IP20
Acceptable ambient temperature	-
Operation	0...+60 °C (+32...+1,400 F)
Storage and transport	-25...+80 °C (-10...+1,760 F)
UC - Control Unit	
Insulation rated voltage Ui	300 V
Supply rated voltage Us	110...240 V ac / V dc a 50/60 Hz
Operating range	0.90 Us ...1.10 Us
Consumption	13 W
Number of digital inputs	4 optically insulated inputs
Number of digital outputs	4 relay outputs
Motor protection via - PTC	-
Trip value	> 3.9 kΩ
Rearm value	< 1.6 kΩ
Terminals (connectors)	-
Torque	0.8...1.2 Nm (7.1...+11 lb - in)
Conductor diameter	-
Rigid and no end sleeve	1 x (0.5...4 mm2); 2 x (0.5...2.5 mm2)
Flexible with/without terminals	1 x (0.5...2.5 mm2); 2 x (0.5...1.5 mm2)
Reset button	Error or failure reset - system
	Trip or alarm reset - protections
Current Measuring Unit (UMC)	
Current ranges	0.25...840 A ac
Degree of insulation Ui	690 V ac
Operating rated voltage Ue	-
IEC60947-4-1	690 V ac
UL 508	600 V ac
Impulse voltage uimp	6 kV
Motor rated frequency	Up to 99 Hz
Application	Single phase and three phase
Diameter for cables	
SRW01-UMC1, SRW01-UMC2, SRW01-UMC3	8 mm
SRW01-UMC4	15 mm
SRW01-UMC5	Busbar
SRW01-UMC6 31 mm or busbar	-
Digital inputs	
Number of digital inputs	4 optically insulated inputs
Source for digital inputs	24 V dc internal source (insulated)
Digital inputs current	11 mA to 24 V dc
Insulation	3 kV
Digital outputs	
Number of digital outputs	4 relay outputs
Contact grouping	2 SPST
	2 SPST common shared
Contact voltage range	12...250 V ac / V dc
Lowest operating power	1 W or 1 VA
Operating capacity per relay contact	-
AC-15 (IEC60947-5-1)	6 A / 24 V ac
	6 A / 120 V ac
	3 A / 230 V ac
	2 A / 24 V dc
DC-13 (IEC60947-5-1)	0.55 A / 60 V dc
	0.25 A / 125 V dc
External protection against short circuit	6 A gL/gG fuse
Mechanical life	1,000,000 operations
Electrical life (AC-15)	100,000 operations (0.5 A / 250 V ac)
	50,000 operations (1.5 A / 250 V ac)
Electrical life (DC-13)	100,000 operations (0.5 A / 250 V dc)
	50,000 operations (1.5 A / 250 V dc)

Advantages of Using MCC

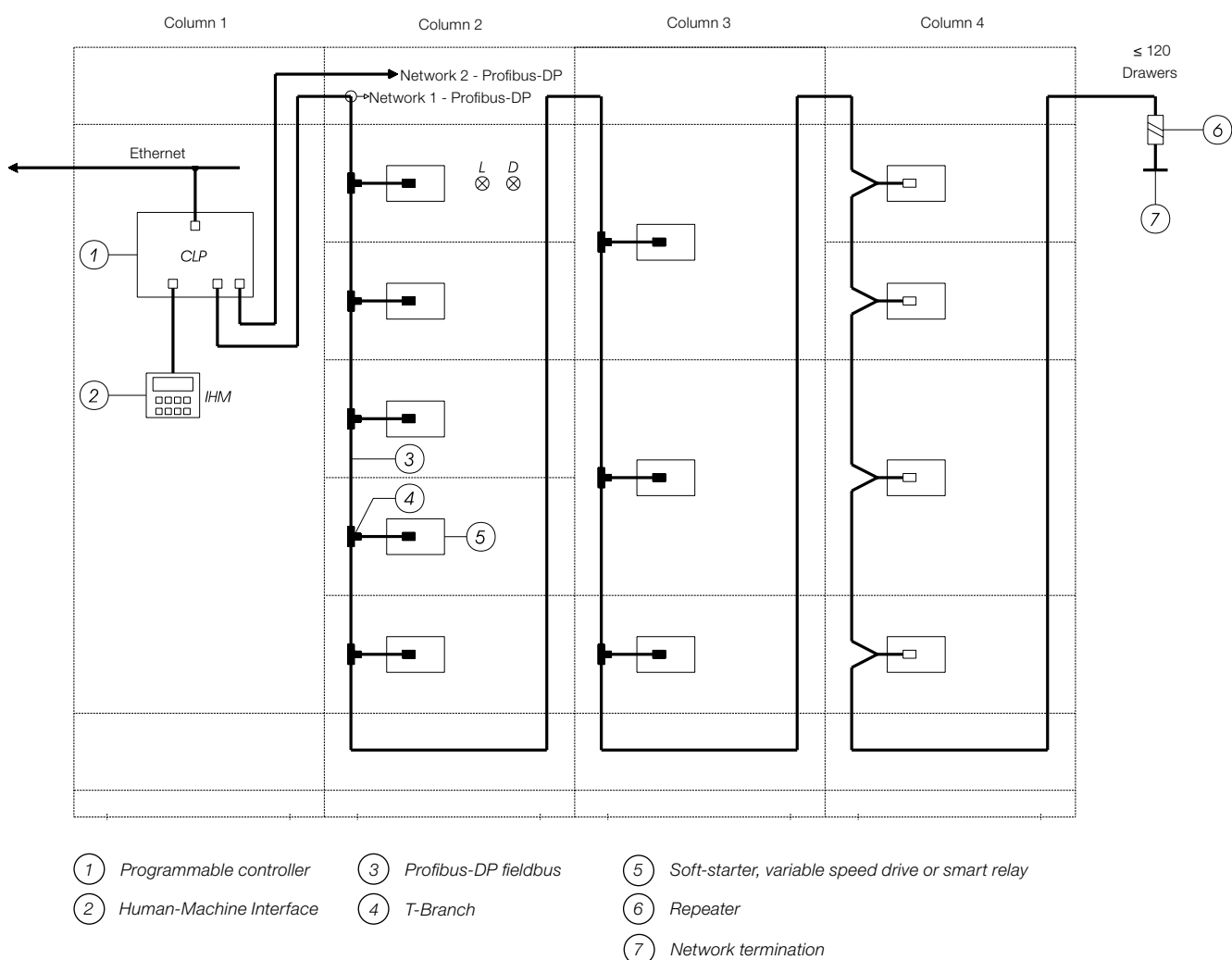
Conventional MCC

- System reliability provides a continuing, uninterrupted service.
- Safety for the personnel installing and operating.
- Effective and centralized way for grouping low voltage motor starters.
- Each unit is fully compartmentalized, which allows more mounting space for components and confines any potential faults within the individual unit.
- Easy, fast and safe maintenance.
- Because of modularity, MCCs can be easily designed and assembled for varied applications.
- Future expansion and modification is easily achieved.

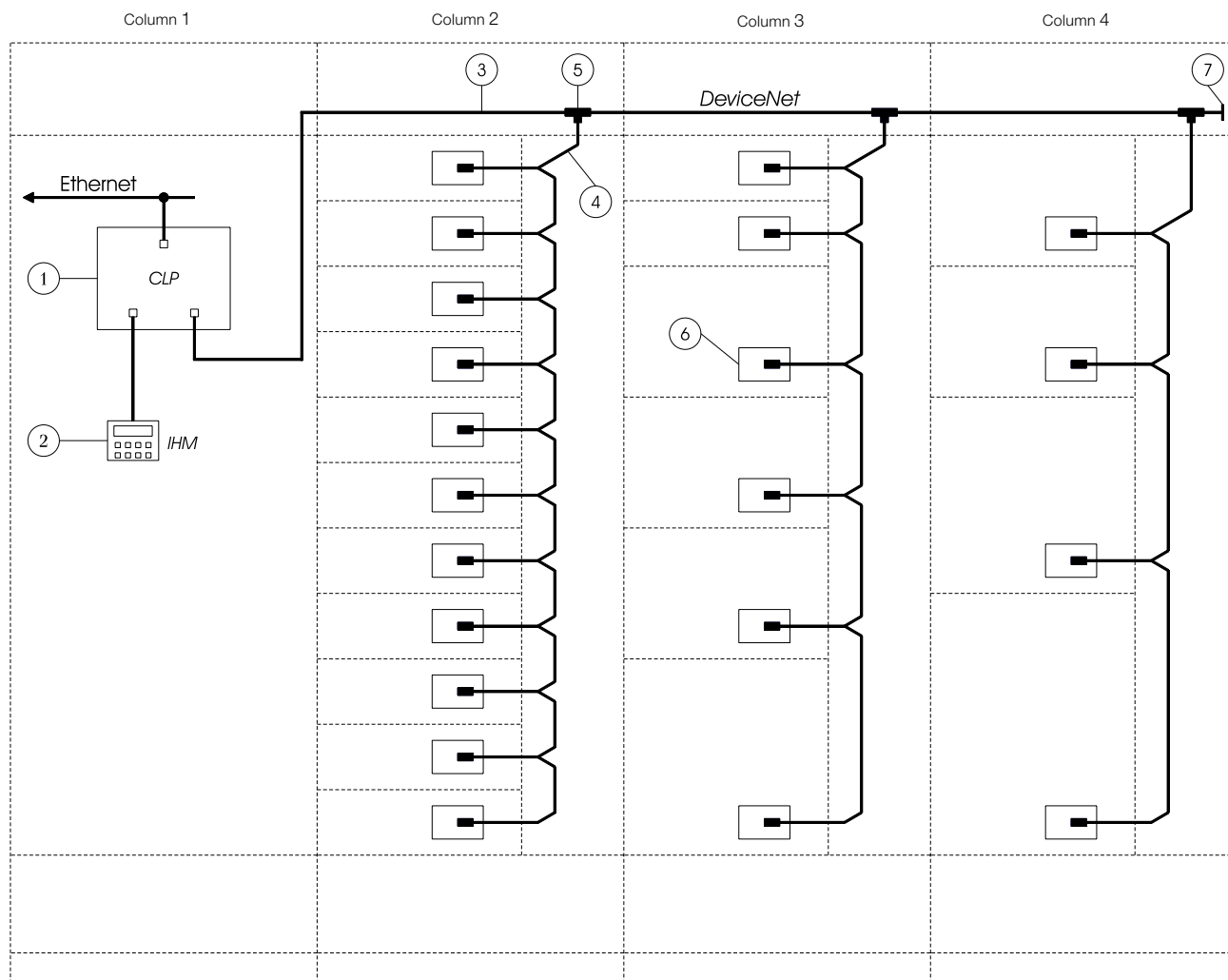
Intelligent MCC

- More reliable protection system.
- Removal of some unit devices like overload thermal relays, current transformers, etc.
- Control cabling reduction.
- Monitoring cabling reduction due to the use of twisted pair.
- Remote control and monitoring via Human-Machine Interface (HMI), PLC or PC.
- Quick fault identification.
- Support to Profibus-DP, DeviceNet or Modbus-RTU communication.
- Communication with other PLC's using an open source protocol.

Example of Intelligent MCCs Using Profibus Communication



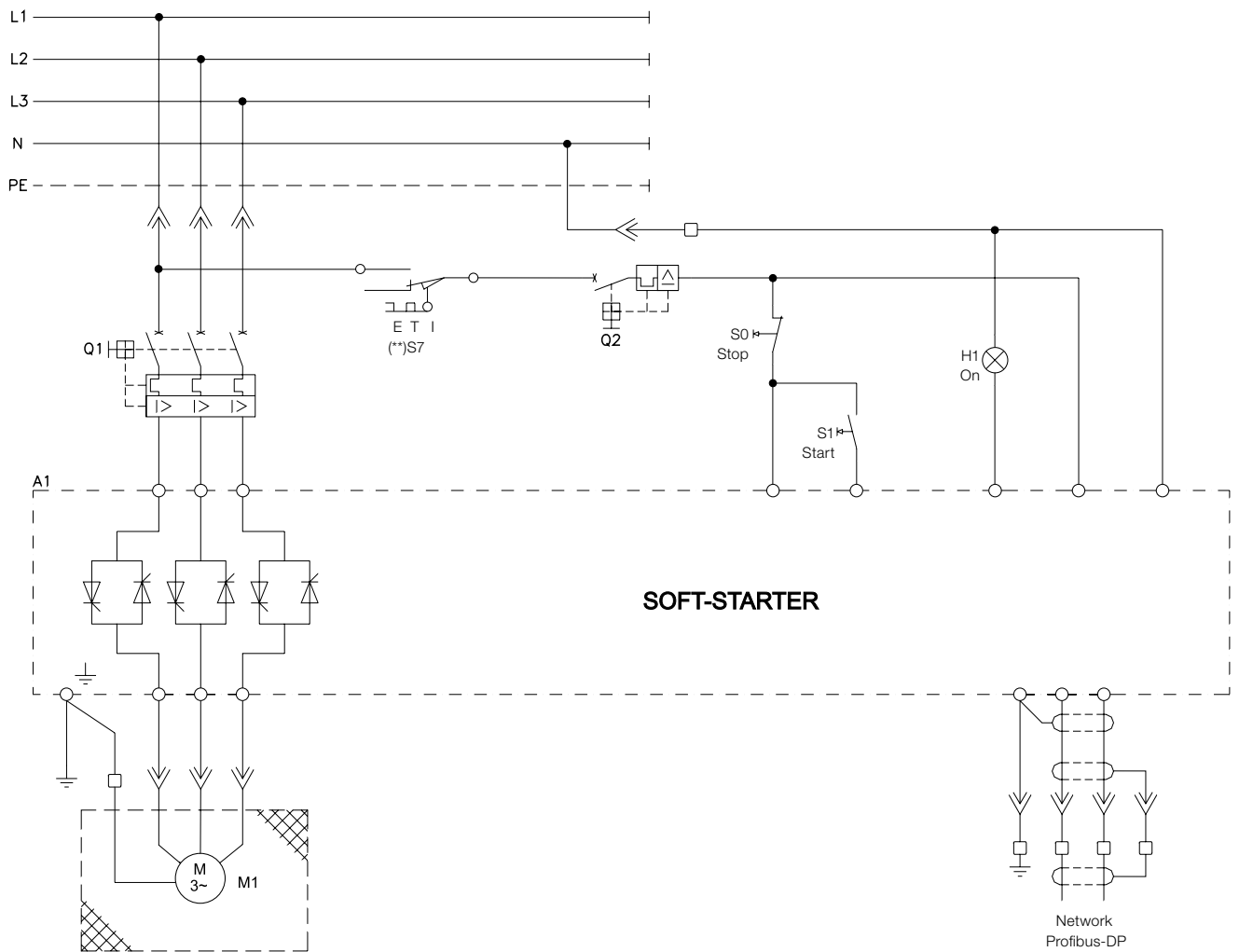
Example of Intelligent MCCs Using DeviceNet Communication



- | | | |
|---------------------------|--------------|---|
| ① Programmable controller | ③ Trunk line | ⑤ T-Branch |
| ② Human-Machine Interface | ④ Drop line | ⑥ Soft-starter, variable speed drive or smart relay |
| | | ⑦ Network termination |



Intelligent MCCs - Unit Diagram



(**) Drawer position
 E = Extracted
 T = Test (eliminated)
 I = Inserted

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