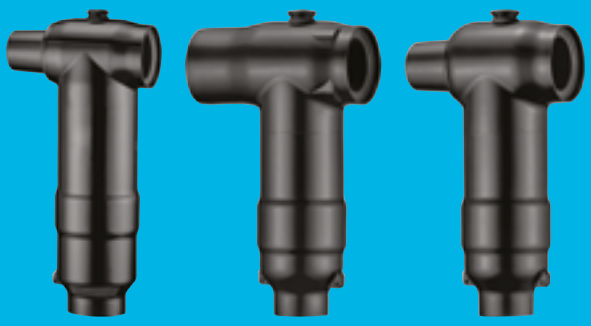
3M Science. Applied to Life.™

Powering your projects.

Flexible Connection Solutions for IEC-compliant equipment



3M™ Medium Voltage
Separable Connectors for IEC

Product overview.

3M™ Medium Voltage Separable Connectors for IEC are reliable, easy-to-install solutions for demanding applications, and meet IEC 60502-4. Our complete portfolio is backed by testing and designed for simplicity. It includes range-taking kits that help reduce the number of SKUs.

Our hands-on on-site training helps installers reduce installation errors. By using our range-taking kits, which help reduce the number of SKUs required, we help our customers improve installation lead times and ordering consistency.

More IEC-compliant medium-voltage solutions coming soon.

3M™ Medium Voltage Separable Connectors Front and Rear T-Plugs for IEC standard applications

High-quality support from start to finish.

3M quality and reliability

3M™ Medium Voltage Separable Connectors for IEC offer 3M quality and reliability, helping provide consistent performance and durability.

- Meets HD 629.1 and IEC 60502-4 Standards
- Complies with REACH and RoHS Regulations

Technical support and on-site training

Hands-on on-site training helps your team reduce installation errors and increase efficiency.

- Training formats include online, virtual and face-to-face options to support professionalism, reliability and productivity
- We provide comprehensive support to our customers
- 3M provides on-site training for technicians and off-site technical support to help enable successful installations

Competitive and comprehensive product offering

The introduction of 3M™ Medium Voltage Separable Connectors for IEC standard applications meets IEC 60502-4 and helps enhance our comprehensive separable product offering, providing supplier simplification and a solution for diverse electrical applications.

- Range-taking kits help to reduce the number of SKUs and simplify inventory
- 3M Electrical Construction Services assist you in selecting the correct kits for your project

Application information.

The 3M™ Medium Voltage Separable Connectors for IEC standard applications meet IEC 60502-4 and are used to terminate cable to a dead front apparatus such as transformers, switchgear and other equipment. They can be used for 12/24/36 kV applications with 630A and 1250A current ratings. These 3M Front and Rear T-Plug Connectors are a good choice for indoor or outdoor applications.

The 3M™ Medium Voltage Separable Connectors for IEC standard applications meet all relevant requirements of HD 629.1 and IEC 60502-4, and fits bushing type C, which follows EN-50180 and 50181 inside medium voltage switchgear and include a mechanical shearbolt lug.

Key features

- Provides a fully shielded and submersible connection when mated with the correct bushing or plug
- Type ‘C’ 630A and 1250A interfaces
- Kitted with range-taking cable adapters and shearbolt lugs
- Compact installation

Performance tests

- 100% electrically tested in production
- Meets European standard specifications:
  – Cenelec HD 629.1
  – IEC 60502-4

Product ratings

Electrical ratings	Test values	Test values
Max. system voltage	24 kV	36 kV
Impulse	125 kV	194 kV
AC withstand (5 minute)	57 kV	85.5 kV
Continuous current	630 A / 1250 A	630 A / 1250 A

Not for specification purposes.

Selection guide for 3M™ Medium Voltage IEC-Separable applications:

All 3M™ Medium Voltage T-Plug kits listed below are designed for copper wire-, aluminium tube-* , copper tape-* and copper wire with aluminium laminate* wire shielded cables.
Each ordering number contains 3 numbers of T-plugs per kit (3 phases).

Asymmetrical T- Type Connectors 630A 1250A Umax 36kV

IEC Separable T-plug front

					Voltage class (U max)		
	SAP number	Item code	Kit description	Min. diameter over primary insulation (mm)	Nominal conductor cross section (mm²)** 12 kV	24 kV	36 kV
630A	7100413958	EE-12-CW1-T-C1-A1-S1 3 Phase 1/CV	3M™ 12kV Asymmetrical T-Plug IEC Separable Connector 630A	12.5-19.5	25-95	-----	-----
	7100413557	EE-24-CW1-T-C1-A2-S1 3 Phase 1/CV	3M™ 24kV Asymmetrical T-Plug IEC Separable Connector 630A	17.0-25.1	-----	25-95	-----
	7100413608	EE-36-CW1-T-C1-A3-S1 3 Phase 1/CV	3M™ 36kV Asymmetrical T-Plug IEC Separable Connector 630A	21.0-30.0	-----	-----	25-95
	7100414033	EE-12-CW1-T-C1-B1-S2 3 Phase 1/CV	3M™ 12kV Asymmetrical T-Plug IEC Separable Connector 630A	19.0-29.0	120-300	-----	-----
	7100413567	EE-24-CW1-T-C1-B2-S2 3 Phase 1/CV	3M™ 24kV Asymmetrical T-Plug IEC Separable Connector 630A	23.6-34.6	-----	120-300	-----
	7100413609	EE-36-CW1-T-C1-B3-S2 3 Phase 1/CV	3M™ 36kV Asymmetrical T-Plug IEC Separable Connector 630A	27.3-38.5	-----	-----	120-300
1250A	7100413638	EE-12-CW1-T-C2-C1-S3 3 Phase 1/CV	3M™ 12kV Asymmetrical T-Plug IEC Separable Connector 1250A	30.0-38.5	400-630	-----	-----
	7100414025	EE-24-CW1-T-C2-C2-S3 3 Phase 1/CV	3M™ 24kV Asymmetrical T-Plug IEC Separable Connector 1250A	34.0-45.0	-----	400-630	-----
	7100413984	EE-36-CW1-T-C2-C3-S3 3 Phase 1/CV	3M™ 36kV Asymmetrical T-Plug IEC Separable Connector 1250A	38.5-50.0	-----	-----	400-630

* Supplementary kit needed

** Check if the diameter over primary insulation is in the appropriate range

IEC Separable T-plug rear (sub-T plug)

					Voltage class (U max)		
	SAP number	Item code	Kit description	Min. diameter over primary insulation (mm)	Nominal conductor cross section (mm²)** 12 kV	24 kV	36 kV
630A	7100414008	EE-12-CW1-R-C1-A1-S1 3 Phase 1/CV	3M™ 12kV Rear T-Plug IEC Separable Connector 630A	12.5-19.5	25-95	-----	-----
	7100413985	EE-24-CW1-R-C1-A2-S1 3 Phase 1/CV	3M™ 24kV Rear T-Plug IEC Separable Connector 630A	17.0-25.1	-----	25-95	-----
	7100413654	EE-36-CW1-R-C1-A3-S1 3 Phase 1/CV	3M™ 36kV Rear T-Plug IEC Separable Connector 630A	21.0-30.0	-----	-----	25-95
	7100414054	EE-12-CW1-R-C1-B1-S2 3 Phase 1/CV	3M™ 12kV Rear T-Plug IEC Separable Connector 630A	19.0-29.0	120-300	-----	-----
	7100414048	EE-24-CW1-R-C1-B2-S2 3 Phase 1/CV	3M™ 24kV Rear T-Plug IEC Separable Connector 630A	23.6-34.6	-----	120-300	-----
	7100413949	EE-36-CW1-R-C1-B3-S2 3 Phase 1/CV	3M™ 36kV Rear T-Plug IEC Separable Connector 630A	27.3-38.5	-----	-----	120-300
1250A	7100413565	EE-12-CW1-R8-C2-C1-S3 3 Phase 1/CV **)	3M™ 12kV Rear T-Plug IEC Separable Connector 1250A	30.0-38.5	400-630	-----	-----
	7100414035	EE-24-CW1-R-C2-C2-S3 3 Phase 1/CV ***)	3M™ 24kV Rear T-Plug IEC Separable Connector 1250A	34.0-45.0	-----	400-630	-----
	7100413625	EE-36-CW1-R-C2-C3-S3 3 Phase 1/CV **)	3M™ 36kV Rear T-Plug IEC Separable Connector 1250A	38.5-50.0	-----	-----	400-630

* Check if the diameter over primary insulation is in the appropriate range
** Type tests pending

Supplementary earthing kit

For non copper wire screen wires, please use one of the following additional supplementary earthing kits.

SAP number	Item code	Kit description
7100414146	94-PAE 610-1 AL-CT supplementary earthing kit	3M™ Supplementary kit, 94-PAE 610-1 AL-CT, size 1 for copper tape and aluminum tube shielded cables for up to 36 kV, 3 Phase per kit/1 kit per case
7100413978	94-PAE 620-1 AL-CT supplementary earthing kit	3M™ Supplementary kit, 94-PAE 620-1 AL-CT, size 2 for copper tape and aluminum tube shielded cables for up to 36kV, 3 phase per kit/1 kit per case
7100413572	94-PAE 621-1 CW-ALF supplementary earthing kit	3M™ Supplementary kit, 94-PAE 621-1 CW-ALF, size 1 for copper wire with aluminum laminate cables up to 36 kV, 3 Phase per kit/1 kit per case

Selection guide supplementary earthing kit

Cable type (screen)	94-PAE 610-1 AL-CT			94-PAE 620-1 AL-CT			94-PAE 621-1 CW-ALF		
	12 kV max	24 kV max	36 kV max	12 kV max	24 kV max	36 kV max	12 kV max	24 kV max	36 kV max
Copper tape	Up to 400mm²	Up to 240mm²	Up to 150mm²	400mm – 630mm²	240mm – 630mm²	150mm – 630mm²	N/A	N/A	N/A
Aluminium tube	Up to 400mm²	Up to 240mm²	Up to 150mm²	400mm – 630mm²	240mm – 630mm²	150mm – 630mm²	N/A	N/A	N/A
Copper wire / Alum. laminate	N/A	N/A	N/A	N/A	N/A	N/A	Up to 630mm²	Up to 630mm²	Up to 630mm²

How the 3M™ Insulating Plug Voltage Sensor integrates with IEC separable connectors.

3M combines high-accuracy voltage and current sensors with industry-standard medium voltage separable connector accessories or build-in sensor technology in the form of 3M™ Sensored Cable Accessories. For advanced applications, 3M sensors measure voltage and current within 0.5% accuracy class and capture higher order harmonics. The small and lightweight 3M™ Insulating Plug Voltage Sensor and the 3M™ Current Coil Split Core are easily installed into the existing switchgears compartments to quickly turn the substation into an intelligent substation. Through IEC 61869-10 and IEC 61869-11, they interface with bi-directional, sensitive short-circuit and power-flow indicators, power quality monitoring devices, modern protection relays or substation RTUs to setup remote communication and control, through IEC 60870, IEC 61850 or other protocols.

3M™ Insulating Plug Voltage Sensor (3M™ IPVS)

- The multi-contour design is compatible with leading separable suppliers including the adjustment to M12 and M16 threads, helping end users to streamline the installation process
- Meets the accuracy class of 0.5 per IEC 61869-11 within the temperature range of -20°C to +60°C
- 3M™ IPVS, as part of the Separable Termination, complies to the test standard CENELEC HD 629.1 S3 Sequence D1 and also to IEC 61869-11
- Output meets the IEC 61869-11 requirements for capacitive voltage divider sensors
- Compatible with the IEC voltage classes of 12 kV and 24 kV Umax
- The 3M™ IPVS is based on a capacitive divider that has a galvanic isolation, thus reducing the size of the 3M IPVS, that easily fit into compact switchgears, which may help avoid height-related space constraints

3M™ Current Coil Split Core (3M™ CCS)

- Rogowski coil technology has a 0.5S accuracy class per IEC 61869-10
- Wide dynamic range and high linearity from 1 A to 50 kA
- Lightweight and split core current coils are easily inserted around the cables
- Dangerous voltages of open-circuited secondary of traditional current transformers eliminated by use of Rogowski coil technology which uses an air core instead of an iron core
- Excellent degree of rejection to the external current conductors

3M™ Sensored Cable Accessories

Product	Product details	
3M™ Insulating Plug Voltage Sensor	► Multi-contoured design compatible with most asymmetrical T-Plugs ► Compact design fits into most compact switchgears ► Up to 24 kV voltage class ► Highly accurate, low-power passive capacitive voltage divider ► Applicable IEC standards and helps enable a precise measurement without on-site calibration	
3M™ Current Coil Split Core	► 500A/225 mV ► 500A/150 mV	
Combined signal cable technology	► Common ground connection for voltage and current sensor providing stable measurements ► Compact design ► Less installation effort ► Less failure risk (due to wrong installation) ► Voltage and current sensing through one connection ► Project based support for the use of pre-programmed sensor parameters in JSON files	
3M™ Sensored Cable Separable QX-2.0 Plug-In	► Passive voltage and current sensors embedded in the plug-in ► Able to replace existing accessories without the need for additional space making it ideal for both retrofit and green field installations	
3M™ Sensored Cable Termination QX-2.0	► Passive voltage and current sensors embedded in the termination ► Able to replace existing accessory without the need for additional space making it ideal for both retrofit and green field installations ► For gas insulated switches with terminations or to fit in termination cable boxes	

3M™ Sensored Cable Accessories are factory calibrated.

Notes

Notes

Discover more, explore today: 3M.co.uk/3M/en_GB/energy-uk/

Important notice

Product Selection and Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product in accordance with all applicable instructions and with appropriate safety equipment, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.

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