

# ClickFit™

PRODUCT RANGE

# Outdoor Terminations



A brand of the

**Prysmian**  
Group

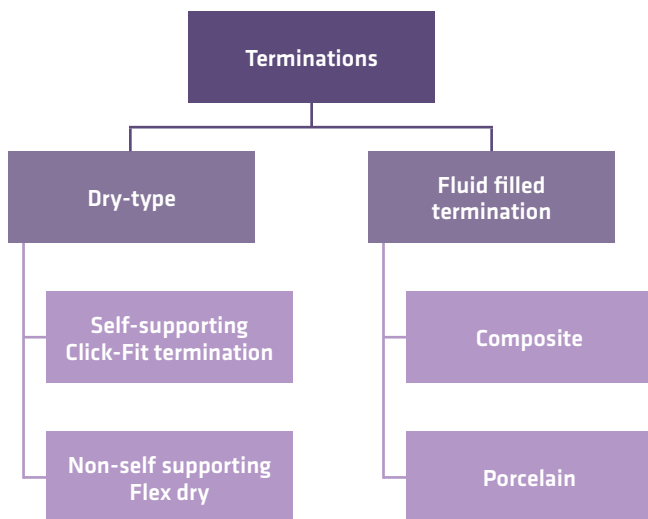
# Click Fit Terminations



## The application

Click-fit outdoor terminations can be split into two main categories. Fluid filled and dry type terminations, which cover a broad range of applications. Outdoor terminations are used in the high voltage power grid for connecting overhead lines to equipment such as switchgear and transformers. Outdoor terminations are highly reliable cable connection assemblies designed to connect extruded high voltage cables. The terminations can also be used to connect mobile energy solutions equipment.

## Overview different outdoor terminations



## Product overview

Available for cable systems with maximum system voltage  $U_m$  [kV]

DESCRIPTION	CODE	Available for cable systems with maximum system voltage $U_m$ [kV]							
		72,5	123	145	170	245	300	420	550
Outdoor termination - composite*	OTC - ( $U_m$ ) - (X)	✓	✓	✓	✓	✓	✓	✓	✓
Outdoor termination - dry type	CFT - ( $U_m$ ) - (X)		✓	✓	✓				
Outdoor termination - flex dry**	FD - ( $U_m$ ) - (X)		✓	✓					

\* Porcelain terminations available upon request

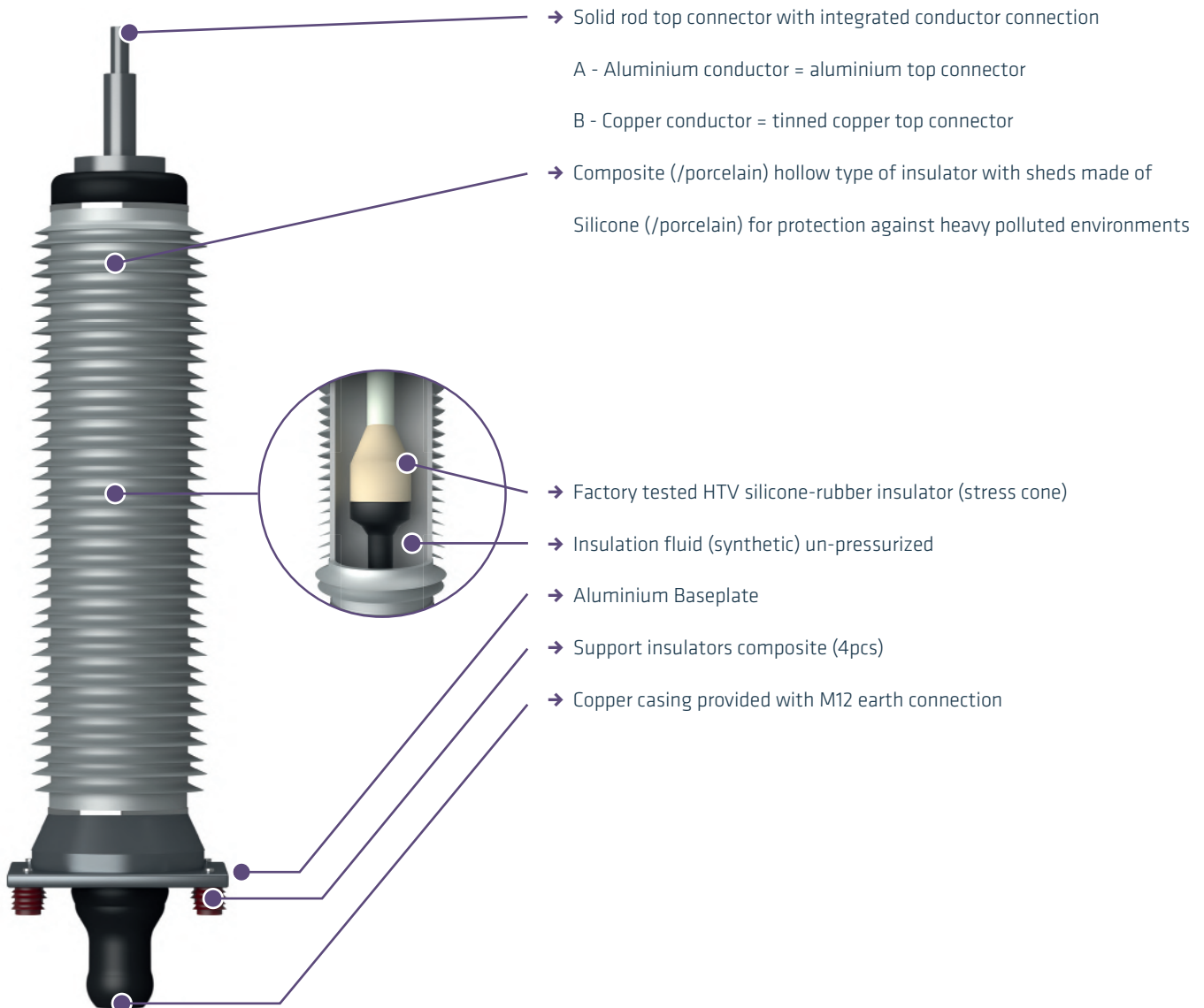
\*\* Non-self supporting design

# Fluid Filled Termination Components

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Outdoor terminations can be supplied with composite (type OTC) or porcelain (type OTP) housings. Outdoor terminations are used to connect extruded HV cables to outdoor equipment and overhead lines. These standard type of outdoor terminations are fluid-filled with unpressurised insulating fluid.

## MAIN COMPONENTS



# Benefits Fluid Filled Termination

## BENEFITS OUTDOOR TERMINATION

	Composite (OTC)	Porcelain (OTP)
<b>Ability to connect virtually any extruded HV cable</b>	Y	Y
<b>Solid rod top connector</b>	Y	Y
<b>No cleaning required, excellent water repellent properties</b>	Y	N
<b>Un-pressured insulating fluid design without expansion tank</b>	Y	Y (<220kV)
<b>Optical fibre integration (optional)</b>	Y	Y
<b>Availability increased creepage distance</b>	Y	Y
<b>100% routine electrical testing (FAT)</b>	Y	Y
<b>Pre-moulded stress cone available for wide range of cables</b>	Y	Y

## OTC TERMINATION IN OPERATION

The cable end being installed with a factory tested, pre moulded, silicone rubber stress cone body over the extruded insulation. The conductor of the cable is connected to the top connector by means of a robust compression, shear-bolt or MIG-welding (only large AI-sizes).

The self supporting termination contains a hollow composite type of insulator with silicone rubber sheds for withstanding very heavy pollution conditions, values according IEC-60815:2008. The cable metal sheath is electrically insulated from the steel construction by the use of epoxy support insulators. Bonding cables can be connected to the tinned copper wiping gland on the M12 connection point below the termination.



# Termination (OTC/OTP) Specifications

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## System Voltage [kV]

72,5    123    145    170    245    300    420    550

### DIMENSIONS

		72,5	123	145	170	245	300	420	550
<b>Max conductor size</b>	<b>[mm<sup>2</sup>]</b>	1.600	2.500	2.500	2.500	2.500*	2.500*	2.500*	2.500*
<b>Max insulation diameter</b>	<b>[mm]</b>	79	100	100	100	117	117	117	128

### TESTING

<b>HVAC routine test</b>	<b>100%</b>	2,5 U <sub>o</sub> -30 min / PD level < 5pC at 1,7 U <sub>o</sub>							
<b>L.I. withstand voltage test</b>	<b>[kV +10/-10]</b>	350	550	650	750	1.050	1.050	1425	1550
<b>24 hr AC-test</b>	<b>[kV]</b>	110	190	240	260	380	380	460	580
<b>1 minute AC</b>	<b>[kV]</b>	140	230	310	325	460	460	-	-
<b>Short circuit current (1 sec)</b>	<b>[kV]</b>	Limited by cable design							

### STANDARDS

<b>Pollution level according</b>	<b>IEC</b>	IEC-60815-2008							
<b>Type Test according</b>	<b>IEC</b>	IEC-60840				IEC-62067			
	<b>IEEE</b>	IEEE-St48							
	<b>NEN</b>	NEN-HD632							

\* Larger cable cross sections upon request

\*\* Refer to datasheets for more details

# Dry Type Termination Components

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The CLICK-FIT® Dry Type Outdoor Termination type CFT is a highly reliable 'Plug-in type' cable connection assembly used for connecting overhead lines to switchgear, transformers and mobile energy solutions.

The termination concept is a fully dry type design, no oil and also no gasses required, only solid factory tested and pre moulded materials are being used which makes the design highly environmental and installation friendly.

## MAIN COMPONENTS



# Benefits Dry Type Termination

ClickFit™

## BENEFITS CLICK FIT TERMINATION

	Dry Type (CFT)
<b>Fully dry type solution, without oil or gas inside</b>	Y
<b>Simplified jointing, Click-Fit concept utilised (reduced installation time)</b>	Y
<b>Reduced network outage time (reduced scaffolding / tents)</b>	Y
<b>Limited number of components</b>	Y
<b>Ability to connect virtually any extruded HV cable</b>	Y
<b>Solid rod top connector</b>	Y
<b>No cleaning required, excellent water repellent properties</b>	Y
<b>High reliability with 100% factory testing (FAT)</b>	Y
<b>Optical fibre integration (optional)</b>	Y
<b>Pre-moulded click-Fit field bodies available for wide range of cables</b>	Y
<b>Insulator is range taking up to 2500 mm<sup>2</sup> Cu (cable related parts are variable)</b>	Y
<b>Maintenance free, no oil leakage</b>	Y

## CFT TERMINATION IN OPERATION

The cable end, provided with a CLICK-FIT® plug, is inserted into the factory tested, pre moulded, silicone rubber insulating body and connected by using silver plated electrical contacts. An integrated metallic grooved ring locks the position of the plugs through a spring-loaded bayonet mechanism. The CLICK-FIT® plug is connected to the cable by means of compression, MIG-welding or shear-off bolts.

Solid composite insulator with silicone sheds for pollution level e according IEC-60815 for withstanding very heavy pollution conditions. The cable metal sheath is electrically insulated from the steel construction by the use of epoxy support insulators. Bonding cables can be connected to the tinned copper wiping gland on the M12 connection point below the termination. The installation, which uses a minimum number of components, is user friendly, increasing the speed of installation.



# Termination (CFT) Specifications




		System Voltage [kV]		
		123	145	170
<b>DIMENSIONS</b>				
<b>Max conductor size</b>	<b>[mm<sup>2</sup>]</b>	2.500*	2.500*	2.500*
<b>Max insulation diameter</b>	<b>[mm]</b>	100	100	100
<b>TESTING</b>				
<b>HVAC routine test</b>		2,5 U <sub>o</sub> -30 min / PD level < 5pC at 1,7 U <sub>o</sub>		
<b>L.I. withstand voltage test</b>	<b>[kV +10/-10]</b>	550	650	750
<b>24 hr AC-test</b>	<b>[kV]</b>	190	240	260
<b>1 minute AC</b>	<b>[kV]</b>	230	310	325
<b>Short circuit current (1 sec)</b>	<b>[kV]</b>	Limited by cable design		
<b>STANDARDS</b>				
<b>Pollution level according</b>	<b>IEC</b>	IEC-60815:2008		
<b>Type Test according</b>	<b>IEC</b>	IEC-60840		
	<b>IEEE</b>	IEEE-St48		
	<b>NEN</b>	NEN-HD632		

\* Nominal operating current max 2000 A

\*\* Refer to datasheets for more details



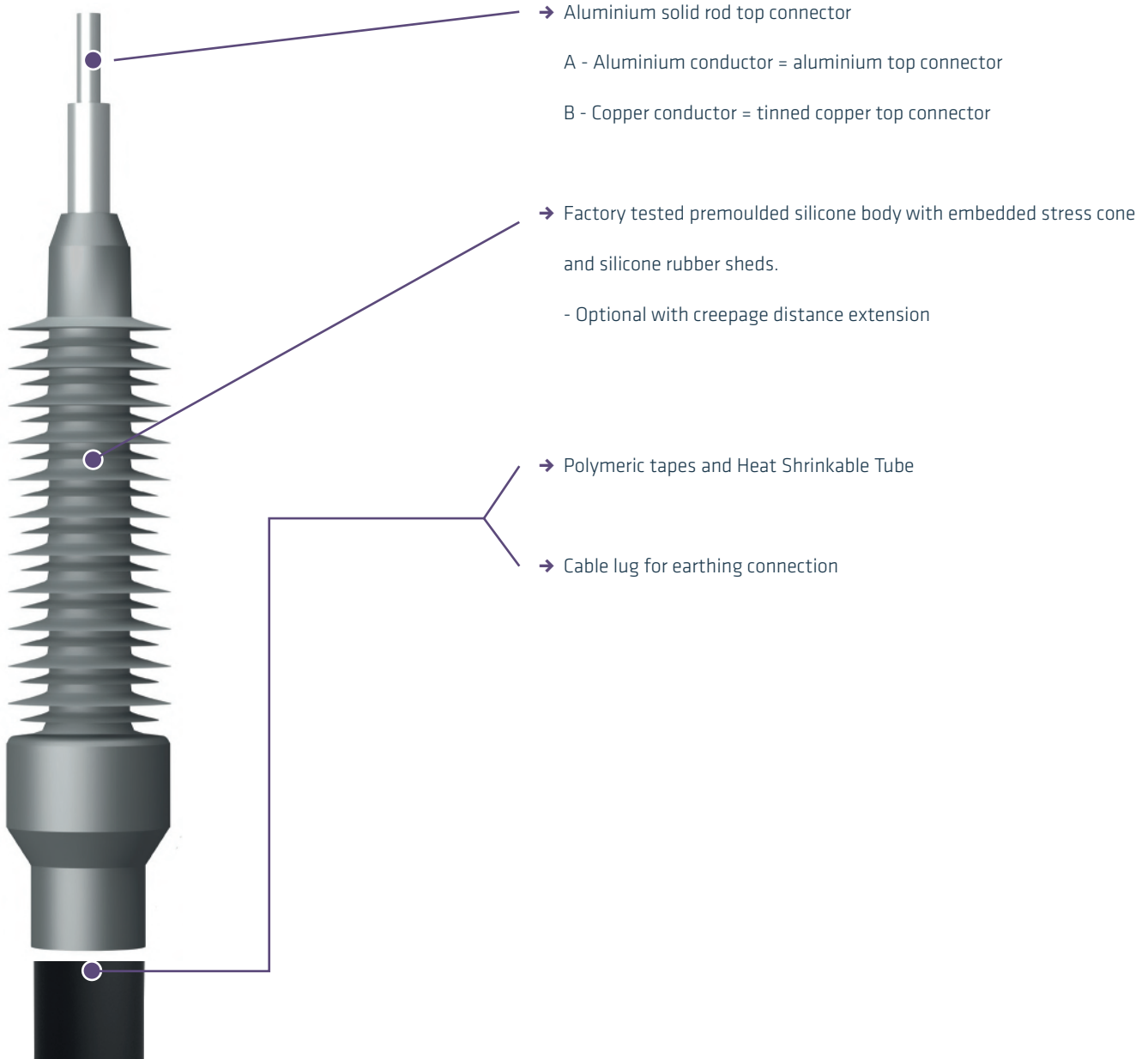
# Flex Dry Termination Components

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The Flex Dry Outdoor Termination type FD is a one piece factory tested, pre-moulded, solid rubber non self supporting outdoor termination. Applicable for tower or pole construction designed for high voltage cable hang off terminations. Also suitable for provisional installations or emergency mobile energy.

The flex dry termination concept is a fully dry type design, no oil and also no gasses required, only solid materials are being used which makes the design highly environmental and installation friendly.

## MAIN COMPONENTS



# Benefits Flex Dry Termination

ClickFit™

## BENEFITS FLEX DRY TERMINATION

	Dry Type (FD) Non self supporting
<b>Fully dry type solution, without oil or gas inside</b>	Y
<b>Simplified jointing, (reduced installation time)</b>	Y
<b>Limited number of components</b>	Y
<b>Solid rod top connector</b>	Y
<b>No cleaning required, excellent water repellent properties</b>	Y
<b>Highly reliable one piece flexible silicone body product, 100% factory testing (FAT)</b>	Y
<b>Maintenance free, no oil leakage</b>	Y

## FD TERMINATION IN OPERATION

The cable end is installed with a factory tested, pre moulded one piece silicone rubber body over the extruded insulation. The conductor of the cable is connected to the top connector by means of a robust compression, shear-bolt or MIG-welding (only large Al-sizes).

The non self supporting termination contains a flexible rubber insulator with silicone rubber sheds for withstanding very heavy pollution conditions, values according IEC-60815:2008. Below the termination a cable lug can be installed for connection to the earthing system.

The installation, which uses a minimum number of components, is user friendly, thus increasing the speed of installation.



# Termination (FD) Specifications

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## System Voltage [kV]

123

145

### DIMENSIONS

		123	145		
<b>Max conductor size</b>	<b>[mm<sup>2</sup>]</b>	1.600	1.600		
<b>Max insulation diameter</b>	<b>[mm]</b>	87	87		

### TESTING

<b>HVAC routine test</b>	<b>100%</b>	2,5 U <sub>0</sub> -30 min / PD level < 5pC at 1,7 U <sub>0</sub>			
<b>L.I. withstand voltage test</b>	<b>[kV +10/-10]</b>	550	650		
<b>24 hr AC-test</b>	<b>[kV]</b>	190	240		
<b>1 minute AC</b>	<b>[kV]</b>	230	310		
<b>Short circuit current (1 sec)</b>	<b>[kV]</b>	Limited by cable design			

### STANDARDS

<b>Pollution level according</b>	<b>IEC</b>	IEC-60815:2008
<b>Type Test according</b>	<b>IEC</b>	IEC-60840
	<b>IEEE</b>	IEEE-St48
	<b>NEN</b>	NEN-HD632

\* Nominal operating current max 2000 A

\*\* Refer to datasheets for more details

## Aerial lug ('Nema-pad') - for OTC - OTP - CFT



To adapt the termination round solid top connector into a square flat connection piece suitable for bolt connection.

**System Voltage [kV]**

**72,5 -550**

**Type**

**Aerial lug\***

<b>Nemapad bronze tinned 2000 A, 1,5 inch / 4 holes connector</b>	X
<b>Nemapad bronze tinned 2000 A, 2,0 inch / 4 holes connector</b>	X

*\*\* Different designs upon request*

## Optical Fiber Exit for OTC - OTP - CFT



To exit the integrated optical fibre(s) from the high voltage cable outside the wiping gland in order to create a possibility to connect an organizer where the fibres can be spliced.

**System Voltage [kV]**

**72,5 -550**

**Type**

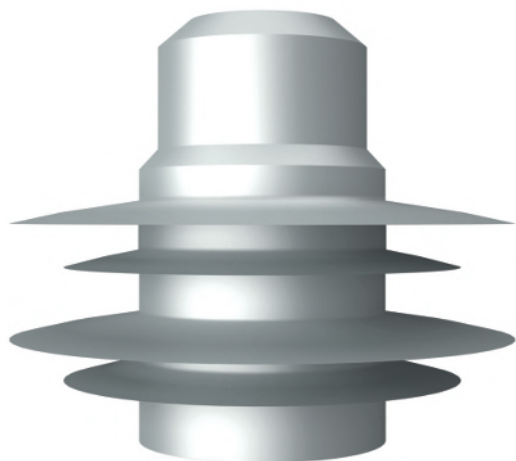
**Optical Fiber Exit**

<b>Without organizer splice box (standard)</b>	X
<b>Including organizer splice box (optional)</b>	X

*\*\* Different designs upon request*

# Additional Components

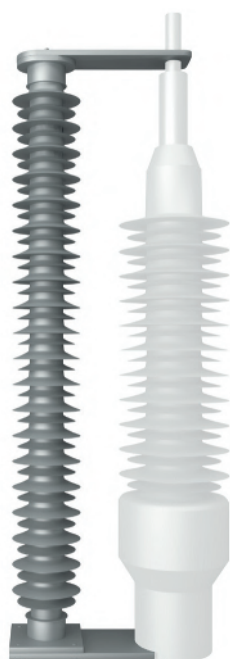
## Flex Dry Extension piece



To extend the flex dry termination creating additional creepage distance for installation in heavily environmental polluted area's.

	System Voltage [kV]
	FD 123/145
<b>Type</b>	
<b>Extension piece</b>	
<b>One extension is 500 mm extra creepage distance</b>	X
<b>Two extensions is 1000 mm (maximum) extra creepage distance</b>	X

## Flex Dry Support



This support can be installed together with the existing flexible FD termination to create a self supporting construction.

	System Voltage [kV]
	FD 123/145
<b>Type</b>	
<b>Flex Dry support</b>	X

*\* Different designs upon request*

# Additional Components

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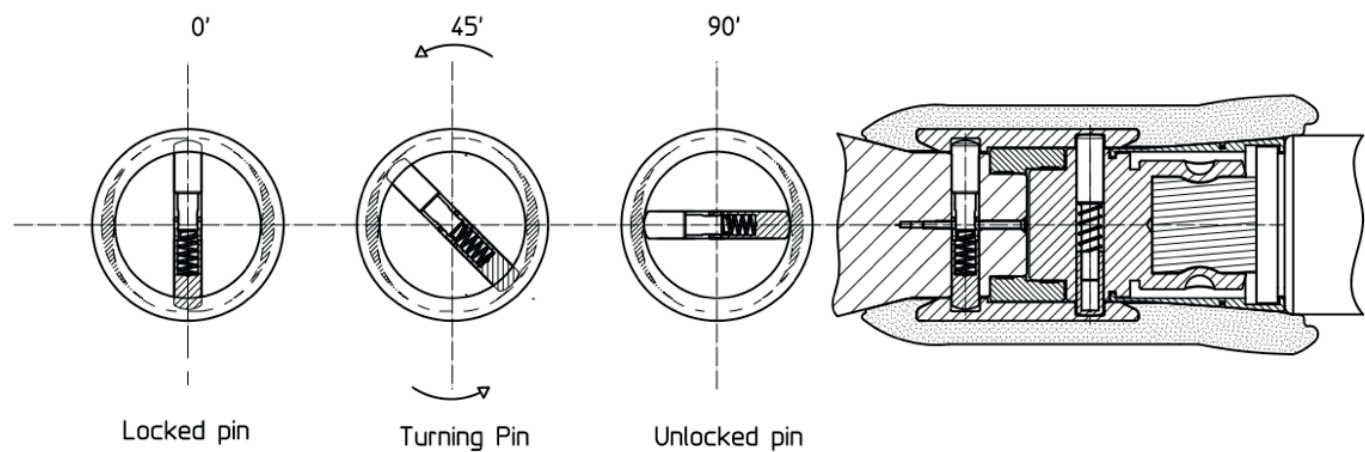
## Factory pre-connectorized cable end

The unique Click-Fit concept allows the cable ends to be prepared in the factory. Connectors are installed on the cables after preparation and they are tested together with the cable. Mechanical protection during transport is ensured by a special protection sleeve with an integrated pulling eye.



## Rotational Click Out

During normal operation, the cable is locked/fix inside the socket insulator. Optionally it is possible to unlock the cable from the socket as well as to unlock the cable from the field body, by using the rotational "Click-Out" mechanism. This requires additional components and tools.



For more details about this feature and other tailor made solutions please contact Click-Fit customer service.

Various toolsets are available for installation of outdoor terminations.

## Tools for cable preparation (details on request)

- Peeling tool for the removal of the insulation screen
- Peeling tool for the removal of the XLPE insulation
- Peeling tool for the removal of the conductor screen
- Peeling tool for insulation fixation groove
- Hydraulic Compression toolset (pump / mould / die)
- Oil filling equipment (pump / drum-heating blanket)

## Tools for termination joint installation (CFT only)

- Pulling flange for installing the Click Fit field body to the solid insulator

## Tools for cable installation (CFT only)

- Cable pulling clamp for installing the cable end into the Click Fit field body

## Tools for pre-moulded silicone body (FD only)

- Pulling device for installing the pre-moulded silicone body onto the cable



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