

ENSTO

*Saves Your Energy*

# Ensto accessories for electricity distribution

*Reliability & efficiency*



# Ensto in short

Ensto is a family business and international cleantech company specializing in the development, manufacture and marketing of electrical systems and supplies for the distribution of electrical power as well as electrical applications. We are committed to lasting sustainable development and our goal is to be the world's leading company in green energy efficiency and distribution. Our products are environmentally friendly, energy efficient and leave a minimum carbon footprint. Ensto has three key business units: Ensto Utility Networks, Ensto Industrial Solutions, and Ensto Building Technology.

## **A wide selection of reliable and durable products**

Ensto Utility Networks offers comprehensive solutions for overhead and underground distribution of electricity. Our products are built to withstand the toughest conditions on earth and are tested according to international standards. Durable products mean uninterrupted service, lower maintenance costs and, above all, satisfied customers.

## **Production**

Ensto Utility Networks offers accessories and solutions for:

- Low voltage overhead lines focused on Aerial Bundled Cable Systems
- Medium voltage overhead lines (for bare and covered conductor lines)
- Low and medium voltage underground cable networks
- Power quality
- Network automation

## **Expert in testing**

Our products are tested according to the toughest national and international standards - actually, we test even beyond standard requirements. Ensto has fully equipped and calibrated testing laboratory in-house, where both components and products are continuously tested. We also work in cooperation with many international test laboratories and use well-known external laboratories for certification testing.

## **Ensto Solutions for low voltage overhead lines**

Ensto has developed solutions and integrated product packages for various low voltage ABC (Aerial Bundled Cable) systems since the early 1960's. These solutions are designed to meet the local conditions and requirements taking into account the urban, rural, forested areas, density of population, climatic conditions, available investments etc. All accessories have been developed and tested in close collaboration with electricity power companies. Our assortment includes special products required by each system and a wide range of products for all systems.



# Ensto in India

## Our business in India

Ensto is enabling India achieve its goals of developing modern and sustainable infrastructure, especially in the segments of electricity distribution, energy saving, power grids, photovoltaic, enclosing solutions for large infrastructure projects, and water- and wastewater treatment.

## Ensto Utility Networks

Ensto Utility Networks business unit has established a production and sales company in India in 2009. The assembly plant is located in Manesar (near New Delhi) and the assembly concentrates on the low voltage overhead line accessories.

The existing Ensto Utility Networks products have been modified locally to suit the Indian market needs and the sales will concentrate on India at the first stage. The new company will comprise also other business functions from marketing to product development and logistics.

## Ensto Industrial Solutions

Ensto Industrial Solutions business unit is specialized in manufacturing high quality enclosing solutions.

Ensto offers a wide range of products for different industries and infrastructure systems. For example, Ensto's UV-blocking enclosures are critical for wind and solar industries in India with their unusually high IP ratings.

In addition, Ensto's products for India include smart building technology products and even EV charging units.

## Contact details

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# Low voltage overhead lines

## Properties and Typical Values of LV ABC (Aerial Bundle Cable) Overhead Line Systems Realized with Ensto Fittings

Character / Criteria	Four core system	Insulated neutral messenger wire	Uninsulated neutral messenger wire
Description	Four equal aluminium alloy conductors including phase – and neutral conductors. The cable can also have separate conductors for street lighting.	Insulated aluminium phase conductors. Insulated aluminium alloy messenger wire, which is also the neutral conductor. The cable can also have separate conductors for street lighting.	Insulated aluminium phase conductors. Bare aluminium alloy messenger wire, which is also the neutral conductor. The cable can also have separate conductors for street lighting.
Minimum breaking loads for the conductor	4x35 mm <sup>2</sup> = 22.4 kN 4x50 mm <sup>2</sup> = 33.2 kN 4x70 mm <sup>2</sup> = 45.3 kN 4x95 mm <sup>2</sup> = 60.8 kN 4x120 mm <sup>2</sup> = 75.2 kN	3x35 mm <sup>2</sup> + 54.6 mm <sup>2</sup> = 16.0 kN 3x70 mm <sup>2</sup> + 54.6 mm <sup>2</sup> = 16.0 kN 3x120 mm <sup>2</sup> + 70.0 mm <sup>2</sup> = 17.7 kN	3x35 mm <sup>2</sup> + 50 mm <sup>2</sup> = 14.7 kN 3x70 mm <sup>2</sup> + 95 mm <sup>2</sup> = 27.9 kN 3x120 mm <sup>2</sup> + 95 mm <sup>2</sup> = 27.9 kN
Sharing of mechanical load	Mechanical load applied in all conductors.	Messenger wire carries all mechanical load.	Messenger wire carries all mechanical load.
Tensile strength of wires of conductor (N/mm <sup>2</sup> )	All conductors 160 N/ mm <sup>2</sup>	Neutral 300 N/ mm <sup>2</sup> Phases 120 N/ mm <sup>2</sup>	Neutral 300 N/ mm <sup>2</sup> Phases 120 N/ mm <sup>2</sup>
Risk of neutral breaking under unexpected loads like falling trees etc.	The neutral is unlikely to break alone, if the installation is made properly. High mechanical strength.	The neutral may break alone, if not provided with weak links. Risk to personnel and apparatus due to risen phase voltage and high potential in neutral, if the earthing is not made properly.	The neutral is reinforced, but it may break alone. Risk to personnel and apparatus due to risen phase voltage and high potential in neutral, if the earthing is not made properly.
Live line work	No special requirements	No special requirements	No special requirements. Uninsulated neutral may have touch voltage in poor earthing conditions. Proper earthing is essential.
Connectors	Same connector can be used for all cores.	Sometimes different connectors for phases and neutral.	Sometimes different connectors for phases and neutral.
Risk of corrosion in the neutral	Reduced risk	Reduced risk	Potential risk in extreme climatic conditions.
Installation methods	No special tools or methods. Suspension clamps with incorporated pulleys available.	No special tools or methods. Pulleys are needed.	No special tools or methods. Pulleys are needed. Economical fittings





## Four Core System

Since the 1970's the Four Core System has been adapted in many Central and North European countries e.g. in Austria, Germany, Ireland, United Kingdom, Poland, Hungary, Russia and Scandinavia. The four insulated conductors that share the tensile load equally, have a size range of 16 to 185 mm<sup>2</sup>. They are made of aluminum with a relatively high tensile strength. Therefore, the breaking load of the cable is relatively high, as well. Insulation of the cores is typically made of XLPE or PE. The cable can be supplied with one or two insulated conductors for street lighting.



### Ensto Four Core Products in Norway

Trollfjord Kraft As has used Ensto solutions from the beginning of the EX cable. The company has been extremely pleased with Ensto's Four Core products as their reliability has been proven in practice many times. Moreover, the installers have given good feedback because the products are so easy to install which, in fact, saves their time and energy.

The company has also had an easy-going relationship with the Ensto staff, and the information flow has been very sufficient. Trollfjord Kraft As are very satisfied with Ensto's solutions and have not had any problems with Ensto's products.

## Insulated Messenger Wire System (IMWS)

An insulated messenger wire cable consists of one to five black, weather resistant, high density or cross-linked, polyethylene insulated conductors twisted around an insulated aluminum alloy messenger (typical tensile strength 300 N/mm<sup>2</sup>). The Ensto portfolio for Insulated Messenger Wire System, Ensto IMWS, includes connectors, tension and suspension clamps, pole fuse switches and various pole support and earthing accessories. Our competitiveness is based on long-term customer relations resulting in safe systems for the most demanding circumstances using durable products. We take care of our customers and offer the best solutions on an individual basis.



### Regular deliveries to Surinam

Surinam has adopted the advanced distribution network model with ABC cables in low voltage lines as a national standard. Thus, the old lines are gradually being replaced by new ABC lines.

For over a decade, one of Ensto's main customers in Surinam has been energy supply company EBS N.V. Moreover, Hedi Infra N.V., a sister company of Hedi Trading, has been a contractor for EBS N.V. for years. According to Hedi Infra N.V., the high-quality Ensto IMWS materials are a vital part of the new generation distribution network.

## Uninsulated Messenger Wire System (AMKA)

Ensto has developed solutions and integrated product packages for various Low Voltage ABC (Aerial Bundled Cable) systems since the early 1960's. The solutions are designed to meet the international and local standards and take into account the special requirements of the urban, rural and forested areas, density of population, climatic conditions, available investments etc. The AMKA System is a reliable, safe and easy way to build a low voltage overhead line system. Because of the small amount of components and short poles it is easy to build and preferred by many professionals. AMKA is used e.g. in Finland, Estonia, Hungary, Russia and Turkey. Ensto offers a complete product package developed especially for the AMKA System.



### ABC project in India

In the second half of 2008 Ensto was involved in building a low tension aerial bundled (LT AB) line in Gujarat Vihar, Delhi. Ensto offered their new customers the effective Ensto network building concept, as well as help in the mechanical and electrical planning. Moreover, Ensto provided the electricians with an extensive theoretical and practical training package and also supplied the necessary products for the project, such as pole fuse switch disconnectors, insulation piercing connectors, tension and suspension clamps and underground cable joints & terminations.



# Ensto connectors

Ensto connectors have been used around the world since the mid 1960's. Our connectors are designed to resist corrosion and bimetallic electrochemical reactions and to endure varying mechanical tensions and other forces detrimental to the connection.

Our portfolio includes:

- Weather- and waterproof insulation piercing connectors
- Parallel groove connectors for both Al/Al and Al/Cu conductors
- Insulating covers for the connectors
- Busbar connectors, cable lugs, cable joints



# Ensto offering

## Low voltage overhead lines



### Copper Bars

Copper bars are used together with busbar connectors to connect Cu- or Al- conductors to high- or low-voltage transformer bushings. It is important to brush and grease the Al-connection. Flat copper bars are tin-plated to reduce corrosion between aluminium and copper. The copper bars and connectors are delivered separately.



### Bird Protectors

Environmental aspects are increasingly important when building an electricity network today. Ensto is working together with electricity utilities and environmental experts to find ways to protect wildlife from electricity distribution network.



### Cable Lugs, Earthing Connectors and Earthing Bars

The cable lugs are used for terminating conductors of 1 kV cables. Because of the shear head bolt construction, no crimping tools are needed. The lugs are water tight and suitable for solid and stranded, sector shaped and circular conductors. Earthing connectors are used for the connection of earthings in pole transformer stations. The earthing conductors can be connected to the bar by using KG connectors.



### Lamp Post Fixtures

Lamp post fixtures are used for connecting and branching aluminium and copper cables in lamp posts and cable cabinets. The fixtures are insulated.



### Pole Fuse Switch Disconnectors

Pole fuse switch disconnectors are used for protecting low-voltage networks. They combine the functions of a fuse, a switch and a disconnector. Pole fuse switches are easy to use as they can be operated from the ground by using a rod. They are also reliable and work for decades even in the most severe conditions. Their reliability and safety has been proved in numerous tests in accordance with IEC and national standards. We manufacture 160 A and 400 A pole fuse switches.



### Fixing Materials for Pole and Wall Mount

AB cables have usually a single layer of insulation only. They are not intended to be installed directly to the supporting surface. The wall mount fittings and the distance clips make it possible to install cables on various surfaces horizontally and vertically.



### Suspension Hooks

AB cables are suspended on wooden, concrete or steel poles and walls. Every support requires its own tensioning device. The Ensto hook program has a solution for all needs and tensions required. The installation is easy and quick and no special tools are needed.



### Stay Wire Accessories and Pole Base Reinforcers

Ensto offers supporting stay wire sets, pole base reinforcers, and pole hats. We have a variety of standardized sets available, which makes the material handling easy and speeds up the line erection process. Ensto's pole base reinforcers increase the life time of the poles.



### Tools

Ensto's tool selection includes products that are especially designed to fit the needs of network installers. Together with our customers we have developed many tools to facilitate the installation work. When installers use tools that fit and are designed for their work, a reliable installation can be made safely. Furthermore, a well-made installation has great impact on the service life and reliability of the network.



# Product information

## Accessories for low voltage distribution networks

### Insulation Piercing Connectors

#### Waterproof insulation piercing connector SLIW 11 series

SLIW11.1 is used with insulated aluminium or copper conductors. Fully insulated bolt provides safe live line working. Both main and branch conductor insulations are pierced by single bolt action. Test voltage 6 kV/50 Hz/1 min in water. Connector's design enables hot line installation without peeling insulation from conductor.

Product code	Main conductor mm <sup>2</sup>	Branch conductor mm <sup>2</sup>	Weight (kg)	Pack./pcs
SLIW11.1	Al/Cu 16-95	Al/Cu 1.5-10	0.052	120
SLIW11.2	Al/Cu 16-95	Al/Cu 2.5-16	0.053	120



#### Waterproof insulation piercing connector SLIW 15 series

SLIW15.1 is used with insulated Al or Cu conductors. Fully insulated bolt provides safe live line working. Both main and branch conductor insulations are pierced by single bolt action. Shear head bolt and end cap are insulated. Test voltage 6 kV/50 Hz/1 min in water.

Product code	Main conductor mm <sup>2</sup>	Branch conductor mm <sup>2</sup>	Weight (kg)	Pack./pcs
SLIW15.1	Al/Cu 16-95	Al/Cu 6-50	0.095	50
SLIW15.16	Al/Cu 16-95	Al/Cu 4-50	0.095	50
SLIW15.161	Al/Cu 10-95	Al/Cu 4-50	0.095	50
SLIW15.17	Al/Cu 16-150	Al/Cu 4-35(50)	0.095	50
SLIW15.18	Al/Cu 16-95	Al/Cu 16-50(95)	0.1	50



#### Waterproof insulation piercing connectors SLIW 17 series

The connector is used in all connections with insulated aluminium or copper conductors. The design enables live line installation without peeling the insulation of the conductors. Test voltage 6 kV/50 Hz/1 min in water.

Product code	Main conductor mm <sup>2</sup>	Branch conductor mm <sup>2</sup>	Weight (kg)	Pack./pcs
SLIW17.1	Al/Cu 25-150	Al 25-95 / Cu 25-70	0.126	50
SLIW17.15	Al/Cu 25-150	Al 25-150 / Cu 25-120	0.136	50
SLIW17.151	Al 25-150	Al 25-150	0.133	50



#### End caps PK99

Grease filled end caps are used for preventing water entry from the end of the branch cable.

Product code	For conductors mm <sup>2</sup>	Weight (kg)	Pack./pcs
PK99.1695	16-95	0.007	300
PK99.70150	70-150	0.007	300



### Aluminium to Aluminium Parallel Groove Connectors

#### Aluminium to aluminium connectors SL37.1 and SL37.2

Non tension aluminium to aluminium connector SL37.1 is equipped with one M8 bolt. Non tension aluminium to aluminium connector SL 37.2 is equipped with two M8 bolts.

Product code	Main conductor mm <sup>2</sup>	Branch conductor mm <sup>2</sup>	Weight (kg)	Pack./pcs
SL37.1	Al 6-95	Al 6-95	0.055	200
SL37.2	Al 6-95	Al 6-95	0.1	50



## Accessories for low voltage distribution networks

### Aluminium to aluminium connector SL39.2

Non tension aluminium to aluminium LV and MV connections. The SL39.2 connector is suitable for AAC, AAAC and ACSR conductors. Equipped with two M8 bolts.

Product code	Main conductor mm <sup>2</sup>	Branch conductor mm <sup>2</sup>	Weight (kg)	Pack./pcs
SL39.2	Al 16-150	Al 16-150	0.12	50
SL39.21	16-150 shear head	16-150 shear head	0.13	50



### Aluminium to aluminium connectors

Aluminium to aluminium LV and MV connections.

Product code	Main conductor mm <sup>2</sup>	Branch conductor mm <sup>2</sup>	Weight (kg)	Pack./pcs
SL2.1	Al 16-50	Al 16-50	0.049	200
SL4.2	Al 16-120	Al 16-120	0.124	50
SL4.21	Al 16-120	Al 16-120	0.13	50
SL4.25	Al 16-120	Al 16-120	0.128	50
SL8.2	Al 50-240	Al 50-240	0.28	25
SL8.21	Al 50-240	Al 50-240	0.29	25



## Aluminium to Aluminium / Copper Parallel Groove Connectors

### Aluminium to copper connector SL39.271

Non tension aluminium to aluminium LV and MV connections.

Product code	Main conductor mm <sup>2</sup>	Branch conductor mm <sup>2</sup>	Weight (kg)	Pack./pcs
SL39.271	Al/Cu 16-150	Al 16-150, Cu 10-120	0.13	50



## Suspension Clamps

### Suspension clamp SO260

For suspensioning of LV ABC cables in an insulated messenger wire system (IMWS). Suitable for every climatic conditions. Bracket is pre installed.

Product code	Bracket	Messenger mm <sup>2</sup>	Messenger dia. mm	Weight (kg)	Pack./pcs
SO260	with bracket	25-95	8.5-15.5	0.37	20
SO260.1	without bracket	25-95	8.5-15.5	0.16	50
SO260.2	only bracket			0.21	50



### Suspension clamp SO265

For suspensioning of LV ABC cables in an insulated messenger wire system (IMWS) with standard hook installation. Easy to install without tools. The messenger is placed to the groove and locked with the locking part. SO265.1 is equipped with wear protection plate.

Product code	Messenger mm <sup>2</sup>	Weight (kg)	Pack./pcs
SO265	16-95	0.1	20
SO265.1	16-95	0.1	20



## Accessories for low voltage distribution networks

### Suspension clamp SO214

Used for the suspension of overhead cables with uninsulated messenger in straight lines and angles up to 90°.

Product code	Messenger mm <sup>2</sup>	Tightening torque Nm	Weight (kg)	Pack./pcs
SO214	16-95	48	0.238	50
SO214.2	16-155	48	0.238	50



## Tension Clamps

### Tension clamps SO250

SO250 series consists of clamps for different messenger cross sections suitable for various climatic conditions. The clamps are easy to install without tools and are available for both bracket and hook installation to wooden, concrete or steel poles. Clamps are supplied with or without the bracket.

Product code	Bracket	Messenger mm <sup>2</sup>	Weight (kg)	Pack./pcs
SO250	with bracket	50-70	0.58	10
SO250.01	without bracket	50-70	0.47	25
SO251	with bracket	95	0.58	10
SO251.01	without bracket	95	0.47	25
SO252	with bracket	25-35	0.58	10
SO252.01	without bracket	25-35	0.47	25
SO252.10	with bracket	25-50	0.52	10
SO250.101	without bracket	25-50	0.41	10
SO253	anchor bracket	-	0.11	25



### Tension clamp SO95

Used for the tensioning cables. Light weight, no loose parts. The clamp is easy to install, without cutting the cable. The body is made of weather and UV-radiation resistant thermoplastic and the bail of hot-dip galvanized steel.

Product code	Cable dia. mm	Weight (kg)	Pack./pcs
SO95	11-19	0.1	50
SO95.1	16-25	0.1	30



### Tension clamps SO3 and SO4

Used for tensioning of an uninsulated messenger (AMKA).

Product code	Messenger mm <sup>2</sup>	Messenger mm	Colour code	Weight (kg)	Pack./pcs
SO3.16	16	4.8	-	0.105	50
SO3.25	25	5.8	Orange	0.103	50
SO3.35	35	6.8	Red	0.103	50
SO3.50	50	8.0	Yellow	0.103	50
SO4.70	70	9.6	White	0.237	50
SO4.95	95	11.3	Black	0.237	50



### Tension clamp SO141

For anchoring of LV ABC with uninsulated messenger (AMKA). The messenger is fitted, the clamp opened, directly into the groove without cutting. Clamp is equipped with eye for cable hoist.

SMFL for various messenger cross-sections are as follows:

- 16 mm <sup>2</sup> - 4.3 kN	- 25 mm <sup>2</sup> - 6.6 kN	- 35 mm <sup>2</sup> - 9.3 kN
- 50 mm <sup>2</sup> - 13.2 kN	- 70 mm <sup>2</sup> - 18.6 kN	- 95 mm <sup>2</sup> - 25.1 kN

Product code	Messenger mm <sup>2</sup>	Tightening torque Nm	Weight (kg)	Pack./pcs
SO141	16-95	44	0.46	25
SO141.3	16-155	44	0.43	25





## Accessories for low voltage distribution networks

### Automatic tension joints

#### Automatic tension joints and joint kits

The automatic joint is reliable and quick to make. No tools are needed for the installation and the with the colour code, you can find the correct size easily. The wedges ensure a safe joint.

Product code	For conductor mm <sup>2</sup>	Conductor diameter mm	Colour code	Weight (kg)	Pack./pcs
CIL63	35 - 50	5.81-8.64	orange / red	0.155	25
CIL64	70 - 95	9.27-12.06	yellow / grey	0.278	25
CIL65	120 - 150	12.75-14.86	pink / black	0.478	25
CIL71	-	14.73-18.40	green / brown	0.840	10
CIL72	-	18.8-21.7	blue / green	1.08	10
Joint kits					
CIL66	insulated messenger 35 - 50	5.81-8.6	orange/red	0.26	1
CIL67	insulated messenger 70-95	9.27-12.06	yellow/black	0.47	1
CIL68	insulated messenger 120-150	12.75-14.86	pink/black	0.79	1



#### Mid Span joints

Pre-insulated joints for ABC-cables. Non tension for insulated phases.

Product code	For conductors mm <sup>2</sup>	Weight (kg)	Pack./pcs
SJ9.16	16	0.59	100
SJ9.25	25	0.56	100
SJ9.35	35	0.53	100
SJ9.50	50	0.49	100
SJ9.70	70	0.44	100
SJ9.95	95	0.37	100



### Pole accessories

#### Phase markers

Phase markers help sharing the load evenly from the transformer to consumer throughout the network. Ensto's Phase Marker kit PEM1337.10 includes three separate color phase markers: red, yellow and blue.

Product code	Description	Weight (kg)	Pack./pcs
PEM1337.10	Red, Yellow, Blue with cable ties	0.03	100
PER15E	Cable tie	0.0012	4000



#### Suspension hooks through the pole SOT15

The suspension hook is used with insulated overhead cables or service cables. The hook is made of hot dip galvanized steel.

Product code	Description	Weight (kg)	Pack./pcs
SOT15.11	Flat type eye hook	0.4	40
SOT15.12	Eye bolt	0.75	25



#### Band COT37 and buckle COT36 for band hooks

Installation with tightening tool CT42.

Product code	Description	Weight (kg)	Pack./pcs
COT37	Steel band	19 mm x 0.75 mm x 25 m, AISI301	2.875
COT36	Steel buckle	for band COT37	0.013



#### Clamp SH168 and hooks SOT29 & SOT39

SH168, SOT29 and SOT39 are used with insulated overhead cables or service cables

Product code	Description
SH168.1	Pole clamp for H-Beam
SH168.2	Pole clamp for R S joist
SOT29	Universal Pole clamp
SOT39	Universal Pole clamp



# Accessories for low voltage distribution networks

## Street lighting

### Branching connector KE10

The connectors can be used for aluminum and copper conductors. Tightening torque is 10 Nm. The connectors are used either inside metal poles or in separate boxes.

Product code	For conductor mm <sup>2</sup>	Conductor diameter mm	Colour	Weight (kg)	Pack./pcs
KE10.1	4 x (Al 10-35 / Cu 1.5-25)	1.7-9.0	transparent	0.044	50
KE10.3	6 x (Al 10-35 / Cu 1.5-25)	1.7-9.0	transparent	0.065	50
KE10.504	4 x (Al 10-50 / Cu 2.5-35)	2.0-10.2	transparent	0.058	50
KE10.504N	4 x (Al 10-50 / Cu 2.5-35)	2.0-10.2	blue	0.045	50
KE10.506	6 x (Al 10-50 / Cu 2.5-35)	2.0-10.2	transparent	0.070	50



### Cover for KE10.504(N)

PMR2635.4 is a protecting cover for connectors KE10.504 & KE10.504N. It is a quick and easy-to-install slip-on cover which is especially designed for installations where double insulation is a requirement. It can also be used as protection against water, for instance in places where water condensation is a problem.

Product code	Depth mm	Height mm	Length mm	Weight (kg)	Pack./pcs
PMR2635.4	40	51	80	0.022	40



## Distribution boxes

### Distribution boxes SK190.1 and SK190.3

Product code	Description	Pack./pcs
SK190.1	Single phase distribution box 1 in 9 out	1
SK190.3	Three phase distribution box 1 in 9 out	1



## Pole fuse switch disconnectors

### Pole fuse switch SZ51

The plastic covers separate different phases from each other, thus in-coming and out-going terminals are under same cover. Connectors included 6 x KG41, poles 3.

Product code	Number of poles	Conductor size mm <sup>2</sup>	Rating	Weight (kg)	Pack./pcs
SZ51	3	Al 2x(16-120)	160 A, 415 V	4.185	1/48



### Pole mounted breaker / digital trip unit D165T - D265T

Circuit breaker for protection of 50 kVA to 160 kVA pole transformers against unbalanced phases and overloads. Integrates an overload release block which models the transformer's thermal image.

Product code	Number of poles	Conductor size mm <sup>2</sup>	Rating	Weight (kg)	Pack./pcs
2003352	4	25 / 70 mm <sup>2</sup>	165 A, 440 V	10	1
2003353	4	50 / 150 mm <sup>2</sup>	265 A, 440 V	10	1



# Accessories for low and medium voltage distribution networks

## Power Quality

### Ensto Voltage Booster

The voltage booster provides a quick and easy solution for improving the quality of electricity. Planning the installation takes only half a day, and the installation itself requires only another half-day. The installation can be made permanent, but the voltage booster can be used also as a temporary solution, until the network is reinforced in some other way.

Product code	Nominal power kVA	Nominal current A	Max input current A	Weight (kg)	Pack./pcs
VB20K3P	3 x 7	3 x 30	3 x 36	105	1
VB30K3P	3 x 10	3 x 44	3 x 52	130	1
VB50K3P	3 x 17	3 x 74	3 x 89	170	1



## Load-break switches

### Ensto Auguste

Ensto Auguste is a pole mounted SF6 load-break switch, configurable as auto-sectionaliser, network open point or point of isolation.

Ensto Auguste offers directional fault detection, measures critical network parameters and interfaces to SCADA systems.

Product code	Rated voltage kV	Rated current A	Breaking capacity A	Pack./pcs
C329302	24 / 36	200 / 400	630	1



## Fault detectors

### LYNX 3400

Directional detector of fault current for underground medium voltage networks.

Product code	Description	Pack./pcs
2005364	Directional fault detector	50



### Ensto Chago Pole

EVT series is designed for free slow charging. Also built-in connection to Automatic Payment System (APS) exists. One or two max. 16A outlets. Stylish and durable design. Easy and straightforward installation.

Product code	Description	Pack./pcs
EVT160.11	Ground mounted charging point, 1 socket outlet	1/12/
EVT160.12	Ground mounted charging point, 2 socket outlets	1/12/
EVT060.11	Wall mounted charging point, 1 socket outlet	1/
EVT060.12	Wall mounted socket outlet, 2 socket outlets	1/



### Ensto Chago Station

Configurable product platform developed for solution where advanced user identification and data communication is required (e.g. billing). IEC 61851-1 compatible. Both 1x16A Mode1 and 3x32A Mode3 charging possible. Stylish and durable design particularly suitable for demanding on-street installations.

Product code	Description	Pack./pcs
EVC100.xx	Ground mounted	1/
EVC200.xx	Ground mounted dual charging station	1/
EVC300.xx	Wall mounted	1/



### Ensto Chago Point

Compact wall or pole mounted charging point. Versions for both 16A Mode 1 and 3x32A Mode 3 available. Stylish and durable design particularly suitable for off-street parking facilities. Also a version for home charging with attached charging cable and Type 1 plug (SAE J1772).

Product code	Description	Pack./pcs
EVP050.12	2x16 A Type F Schuko	1/30/
EVP050.12-E	2x16 A Type E French	1/30/
EVP070.01	Mode3 Type1	1/30/
EVP070.12	3x32A Mode 3 Type 2	1/30/
EVP070.13	3x32A Mode 3 Type 3	1/30/





## Tools

### Wire brush ST18

In aluminium connections it is important to remove the Al-oxide from the aluminium surfaces by using a wire brush. Use of joint compound SR 1 prevents further re-oxidation. ST18.2 is the case for ST18.

Product code	Weight (kg)	Pack./pcs
ST18	0.072	1
ST18.2	0.022	1



### Joint compound SR1

Used for the prevention of oxidation on aluminium surfaces. The use of the wire brush and joint compound SR1 reduces the contact resistance. It also protects the connection from corrosion. There are no skin irritating ingredients in the grease.

Product code	Weight (kg)	Pack./pcs
SR1	0.254	25



### Ratchet wrench CT164

For installation of connectors and suspension fittings. The wrench body is made of steel and the grip of oil resistant rubber. The wrench is double-sided 13 and 17 mm.

Product code	Weight (kg)	Pack./pcs
CT164	0.254	20



### Torque wrench ST30

For tightening connectors and fittings with standard sockets. With aluminium connectors, it is essential that the bolts are tightened by using the correct torque. ST30 is a high quality adjustable wrench with a wide torque range. The read-outs are given in Nm and lbs.-ft. Socket adaptor mount 1/2". Tightening torque is 8-54 Nm.

Product code	Weight (kg)	Pack./pcs
ST30	0.89	10



### Sockets for torque wrench ST30: ST12, ST13 and ST115

Product code	Socket size (mm), form	Weight (kg)	Pack./pcs
ST12	17 mm, hexagonal	0.066	20
ST13	13 mm, hexagonal	0.056	20
ST115	19 mm, hexagonal	0.075	20



### Allen key ST32

Approved also for insulation piercing connectors with conductors live.

Product code	Socket size (mm), form	Weight (kg)	Pack./pcs
ST32	6 mm, allen key	0.079	25



## Tools

### Fork wrench ST34

The ST34 is for holding the connector while tightening the bolts. Approved also for insulation piercing connectors with live conductors.

Product code	Weight (kg)	Pack./pcs
ST34	0.337	25



### Wedges ST31 and ST192

During the installation of connectors the phase conductors of an insulated overhead cable can be separated by using wedges. The wedge can also be used when installing suspension clamps.

Product code	Description	Weight (kg)	Pack./pcs
ST31	Two plastic wedges	0.109	10
ST192	Plastic wedge for LV ABC	0.14	10



### Wire stringing wheels ST26.1, ST26.11, ST26.22 and ST26.33

Used for pulling in overhead cables. ST26.1, ST26.33 and ST26.11 are used for straight lines and small angles up to 30 degrees. Double pulley ST26.22 is used for larger angles up to 90 degrees.

Product code	Description	Weight (kg)	Pack./pcs	
ST26.1	Stringing wheel	Cable groove 50 mm, nylon	1.458	10
ST26.11	Stringing wheel	Cable groove 50 mm, nylon, with chain attachment	3.9	3
ST26.22	Stringing wheel	Cable groove diameter 50 mm, nylon with chain attachment, double pulley	6.25	3
ST26.33	Stringing wheel	Cable groove 77 mm, aluminium	2.172	5



### Tightening tool CT42

CT42 is a special tool which is used for tightening the steel band COT37.

Product code	Weight (kg)	Pack./pcs
CT42	1.95	1



### Pole climbing irons CT2

Made of Al-alloy. The irons can be adjusted with different sizes of wooden poles.

Product code	Pole diam. mm	Weight (kg)	Pack./pcs
CT2	140-300	4.2	1



### Pole climbing irons ST155

Made of alloyed and heat-refined steel. The welded and forged areas of the irons, are tested for cracks. Irons ST155 are supplied with straps.

Product code	Pole diam. mm	Weight (kg)	Pack./pcs
ST155.8	Max. 200	2.6	1
ST155.11	Max. 280	2.7	5
ST155.14	Max. 350	2.8	1



## Tools

### Come along clamps ST102 for four core cables

For tensioning overhead line spans of four core cables. The grips cover a wide range of diameters and can apply high-tension force. ST102 uses an articulated construction. It is easy to mount and change on the line.

Product code	Description		Weight (kg)	Pack./pcs
ST102.50	Come along clamp	4x25-50 mm <sup>2</sup>	2.3	1
ST102.95	Come along clamp	4x70-95 mm <sup>2</sup>	4.31	1
ST102.120	Come along clamp	4x120 mm <sup>2</sup>	4.3	1



### Come along clamps CT102 and CT105

For tensioning both bare and covered conductors overhead line spans. The grips cover a wide range of diameters and make a good fixing and high tension force.

Product code	Conductor diameter mm		Weight (kg)	Pack./pcs
CT102.501	7.87-13.46		1.7	1
CT102.1201	13.46-18.80		3.77	1
CT105.20	4-20		2.75	10
CT105.35	3-8		0.828	1
CT105.70	5-10		1.16	1



### Pulling grip CT103

Pulling grips are made of high-grade galvanised steel wire, in a double weave construction for safe and secure cable pulling. Grip length 600 mm.

Product code	Diameter mm		Weight (kg)	Pack./pcs
CT103.35	20-30		0.232	1
CT103.50	30-40		0.303	1
CT103.95	40-50		0.586	1



### Dynamometer ST112

Used for setting the correct tension on all kinds of overhead line conductors. The dynamometers are light-weight and compact. They have a built-in measuring dial with scales according to the Maximum load.

Product code	Maximum load kg	Step (kg)	Weight (kg)	Pack./pcs
ST112.1	1000	20	1.179	1
ST112.2	2000	50	1.2	1
ST112.3	3000	50	2.3	1



### Cable hoist ST116 and CT116

Ratchet puller for line tensioning.

Product code	Lift height m, single/double wire	Capacity kg, single/double wire	Weight (kg)	Pack./pcs
ST116	3/1.5	500/1000	4.53	1
ST116.1	4/2	750/1500	5.000	1
CT116.3	4.57 (15 Ft) / 2.29 (7.5 Ft)	454 (1000 lbs) / 908 (2000 lbs)	6.39	1
CT116.7	9.15 (30 Ft) / 4.58 (15 Ft)	680 (1500 Lbs) / 1360 (3000 Lbs)	7.02	1



### Swivel for conductor linking CT104

Swivels are essential for effective pulling operation of underground cables and overhead conductors. The swivels are fitted with bearings to prevent build up of twist and loops in the cable or pulling rope. Rope dia. 10 mm, working tension 10 kN.

Product code	Weight (kg)	Pack./pcs
CT104	0.45	20





The information in this brochure is to the best of Ensto's knowledge and belief correct and reliable. We reserve the right to make changes in the specifications, materials and production methods without further notice. Be aware of that you have to evaluate independently the suitability of each product for the intended application. Ensto does not give any assurance of any particular quality or performance. Our responsibilities for the products are set forth in the "Orgalime S 2000 General Conditions for the Supply of Mechanical, Electrical and Electronic Products". The products shall be installed only by a competent person having nationally required knowledge. Ensto is not responsible for its distributors or for any misuse, incorrect installation or ignored national safety or other national provisions.

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## Ensto

Ensto is a family business and international cleantech company specializing in the development, manufacture and marketing of electrical systems and supplies for the distribution of electrical power as well as electrical applications. We are committed to lasting sustainable development and our goal is to be the world's leading company in green energy efficiency and distribution. Our products, manufactured in seven different countries, are environmentally friendly, energy efficient and leave a minimum carbon footprint.

## Cleantech

Cleantech means all those products, services, processes and technologies which prevent or reduce the impacts of actions harmful to the environment. Cleantech stands for better quality, efficiency and profitability. Ensto and other Finnish cleantech companies are already at the top of the world in several key cleantech sectors.

UN1IND/11/2013

## Facts

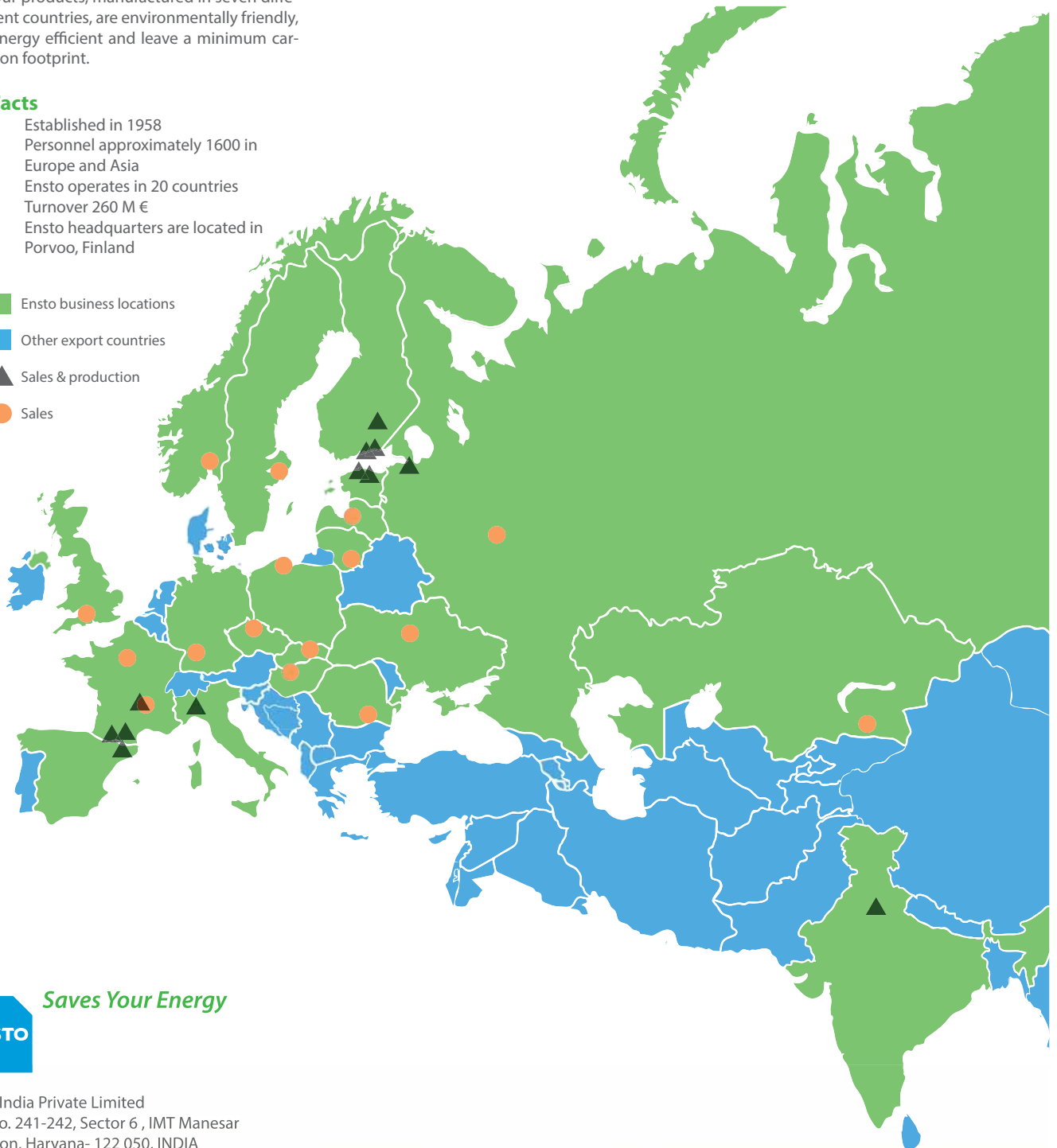
- Established in 1958
- Personnel approximately 1600 in Europe and Asia
- Ensto operates in 20 countries
- Turnover 260 M €
- Ensto headquarters are located in Porvoo, Finland

■ Ensto business locations

■ Other export countries

▲ Sales & production

● Sales



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