


73224180	DATA SHEET	
Valid from: 19.10.2020	ÖLFLEX® PLUG 540 P single-phase hookup assembly	

Application

The harnessed assembly [cordset/wire harness] ...product named “ÖLFLEX® PLUG 540 P single-phase hookup assembly” covers multiple versions of cut-to-length, chemically and mechanically robust, yellow-coloured, PUR-sheathed, industrial, oil resistant, flexible, low-voltage power cord ÖLFLEX® 540 P by LAPP added by different options of moulded (“non-reconnectable”) single-phase plugs as per DIN VDE 0620-2-1 with 250 V in normatively rated voltage and 16 A in normatively rated ampacity for common, building-installed, alternating-current TN grids with a frequency between 50 Hz and 60 Hz, and with 230/400 V in nominal AC RMS system voltage U_0/U .

The optional 250 V plug versions differ from each other in terms of contacts, IP protection type, or mechanical VDE tests.

The metre-ware cable provides VDE registration of the manufacturer U.I. Lapp GmbH and varies as far as number of single cores, nominal conductor cross section, single core colouring (possible inclusion of green-yellow equipment grounding conductor as third single core), nominal IEC voltage class, size, or actually used length are concerned, for example.

IEC nominal voltage class of the used metre ware cable exceeds the single-phase plug’s rated voltage significantly. However, from a product selection standpoint, the cable’s nominal voltage only indicates to some extent, which use category and mechanical demand grade the entire, finished assembly may be appropriate for and be in line with, and that particularly in Europe, yet still depending upon nationally given ruleset. But when it comes down to maximum operating voltage of the entire, finished assembly, the **plug’s normatively rated voltage of 250 V** represents the **only actually permissible reference**, whereas the metre-ware **cable’s** nominal IEC **voltage class** does **on no account**.

All moulded plug versions of this product are third-party certified to plug design type reference DIN VDE 0620-2-1.

Certain versions of this assembly product meet the technical requirements acc. to German BGI 594.


Depending upon product version by LAPP part number, and subject to nature of branch circuit supplied load, where powering the like, certain versions of this harnessed assembly product meet the technical requirements of use category K1 or of use category K2 acc. to German BGI/GUV-I 600. Based on the plug’s IP protection type and nominal voltage class of the cable, certain versions of this assembly product are additionally suitable as standard plug(-fit) device for and on installation/construction sites as per German DGUV Information 203-006 (BGI/GUV-I 608) if secluded from special use conditions. This suitability as well as applicableness for use category K2 are given under the sum of all joint conditions listed below:

- IP protection type IP44 (splash-water proof) of the moulded plugs (applies to standard design type CEE 7/7 under this product), and
- 2-pole plug features earth contact(s) (under this product, all standard plug versions with earth contacts follow design type CEE 7/7 with earth contacts acc. to plug-fit system types E and F), and
- Plug test as per Appendix C of DIN VDE 0620-2-1 for heavy-duty (mechanical) conditions (under this product, always given under standard plug design type CEE 7/7), and
- IEC nominal AC RMS voltage class U_0/U of the used metre ware cable ÖLFLEX® 540 P by LAPP amounts to 450/750 V (given for metre-ware cable’s conductor cross sections from 1.5 mm² and larger)

Please note that versions with IP protection type IP20 (under this product: all standard versions with CEE 7/17 type of plug design, without earth contacts) must not get in contact with water and should not be intended for industrial application or construction/installation sites normally, independently from the robustness of the attached metre-ware cable ÖLFLEX® 540 P.

Attention during installation regarding Tensile Strain Relief: The supple material of the cable’s single core insulations has got a floating nature/stretchability, thus during wiring it shall be made sure that the cable’s single cores be relieved from tensile strain. Unplugging from power source/ socket (female) by grasping and pulling on the black plug (male) only, not on the yellow cord.

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Design, Properties, Tests

(1) Used metre ware cable ÖLFLEX® 540 P [unshielded] by LAPP

Design

Design	based on EN 50525-2-21 & EN 50525-2-51
Certification	up to 1.0 mm ² : < VDE-REG 6583 > from 1.5 mm ² : < VDE-REG 6584 >
Conductor	fine wire strands of tinned copper acc. to IEC 60228 resp. EN 60228, Class 5
Insulation	thermoplastic elastomer (TPE)
Core identification code	coloured acc. to HD 308/VDE 0293-308 with or without GN/YE ground conductor acc. to DIN EN 50334: 2-core (without ground conductor): BROWN (BN) + BLUE (BU) 3-core (with ground conductor): GREEN-YELLOW (GNYE) + BROWN (BN) + BLUE (BU)
Outer sheath	polyurethane compound TPU acc. to EN 50363-10-2 colour: Yellow
Nominal, outer diameter	2X0.75 [part number 0012452]: 6.2 mm 3G0.75 [part number 0012453]: 6.7 mm 2X1.00 [part number 0012457]: 6.7 mm 3G1.00 [part number 0012458]: 7.1 mm 2X1.50 [part number 0012462]: 8.3 mm 3G1.50 [part number 0012463]: 8.8 mm

Electrical properties at 20 °C

IEC nominal AC voltage U ₀ /U	up to 1.0 mm ² : 300/500 V from 1.5 mm ² : 450/750 V
AC test voltage	up to 1.0 mm ² : 3000 V from 1.5 mm ² : 3500 V

From some insurance companies' perspective, the IEC nominal voltage class of the metre-ware cable may be crucial for the appropriateness of certain use types which the complete, finished, harnessed assembly might be intended for individually. But **by no means** does the IEC nominal voltage class of the metre-ware cable represent a reference one can derive the maximum permissible operating voltage of the complete, finished, harnessed assembly from. Instead, **solely** the plug's rated voltage of 250 V per DIN VDE 0620-2-1 matters in terms of upper limit of operating voltage of the complete, finished, harnessed assembly.


Mechanical and chemical properties

Minimum bend radius	occasional flexing: 10 x outer cable diameter fixed installation: 4 x outer cable diameter
Flammability	acc. to IEC 60332-1-2 resp. EN 60332-1-2
Freedom from halogens	acc. to VDE 0472-815
UV resistance	acc. to EN 50618 acc. to EN 50620 acc. to EN ISO 4892-2, Method A (change of colour allowed)
Oil resistance	acc. to EN 50363-10-2
MUD resistance	acc. to IEC 61892-4, Annex D
Water resistance	acc. to EN 50525-2-21
General requirements	these cables conform to the EU Directive 2014/35/EU (Low Voltage Directive)
Environmental	these cables meet the substance-specific requirements of the EU Directive 2011/65/EU (RoHS).

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(2) First cable end – moulded single-phase plug versions as per DIN VDE 0620-2-1 with 250 V in rated voltage

a) General data

Application	single-phase AC operation, connected to commonly building-installed TN infrastructure power grids with IEC nominal AC RMS voltage $U_0/U = 230/400$ V
Design type standard	DIN VDE 0620-2-1
Outer bond with cable	moulding (“non-reconnectable”)
Number of loaded circuit pins	2 (without or added by earth contacts) = single-phase
DEKRA certified design	KEMA-KEUR certification mark, acc. to DIN VDE 0620-2-1
Functional pole-to-pin allocation	acc. to HD 308/VDE 0293-308 (core colour code of the cable) acc. to functions of DIN EN 60445/VDE 0197 CSN: in case of frontal view on the oncoming pins of the plug with type-E earth pin hole above, phase L (live/line) is behind right pin, whereas neutral conductor (blue) is behind left pin
Rated voltage	250 V
Max. AC RMS operating voltage	250 V
Normatively rated ampacity	16 A
IP protection types	acc. to DIN VDE 0620-2-1 in conjunction with DIN EN 60529/VDE 0470-1
Material colour	black
Reinforced tensile strain relief	Only on request, and close to the standard product: <i>Additionally</i> reinforced tensile strain relief between the cable’s outer sheath and the plug’s moulding, under additional LAPP part number

b) Versions of moulded plug

b.1) Round, straightly shaped, 2-pole pin attachment contour central plug w/o earth contact (CEE 7/17 style)


Prohibition of use	any contact with humidity or liquid of any type shall be avoided at all costs regularly not to be intended for industrial application or construction/installation site
Shape/contacts	round contour plug without earth contacts central plug: straightly shaped, not rectangular CEE 7/17
Intermateable/plug compatible	plug-fit systems type F and type E (e.g.: French, Czech, ...)
Material	polyvinyl chloride (PVC)
IP protection type	IP20 acc. to DIN EN 60529/VDE 0470-1
Cable’s number of cores	2 (green-yellow, protective equipment grounding conductor not existent inside this cable)

b.2) Straightly shaped, 2-pole Schuko earth contact central plug (CEE 7/7 style), IP44 protection type

Application	splash-water proof acc. to DIN EN 60529/VDE 0470-1 from 450/750 V in IEC nominal AC RMS voltage class U_0/U of the cable (given from nominal conductor cross section of 1.5 mm ² or larger): <ul style="list-style-type: none"> for industrial use category K2 as portable/non-stationary, electrical, not entirely watertight (IP44, not IPX7) equipment acc. to German BGI/GUV-I 600 as standard plug device on construction/installation sites, where secluded from special use conditions, acc. to German DGUV Information 203-006 (BGI/GUV-I 608) more preferable in case of increased, electrical hazard acc. to German BGI 594
Shape/contacts	SchuKo earth contact central plug (central = straightly shaped, not rectangular) CEE 7/7: with earth contacts acc. to types F (doubly: top and bottom) and E (pin hole)
Intermateable/plug compatible	plug-fit systems type F and type E (e.g.: French, Czech, ...)
Grounding by earth contact	plug-fit systems type F and type E (e.g.: French, Czech, ...)
Material	polyvinyl chloride (PVC) alternatively more robust TPE under reserved LAPP part number circle 73224198 et seq.
IP protection type	IP44 (splash-water proof) acc. to DIN EN 60529/VDE 0470-1, independently from nominal conductor cross section or IEC nominal voltage class of the metre-ware cable
Pressure test	regardless of metre-ware cable’s nominal conductor cross section or nominal voltage class: plug tested acc. to DIN VDE 0620-2-1, Annex C for heavy-duty (mechanical) conditions, incl. surface-marked hammer symbol acc. to DIN ISO 7000 and German DGUV Information 203-006 (BGI/GUV-I 608), and pressure tested acc. to Section 24.5 of DIN VDE 0620-2-1
Cable’s number of cores	3 (incl. green-yellow, protective equipment grounding conductor)

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(3) Opposite cable end – dismantled, stripped, crimped sleeves

Dismantling

Dismantled length from cable end 3 cm

Crimping of crimp sleeves

Properly stripped core insulations

Crimp for each single core

crimp sleeves with metal collar and without cable lug acc. to DIN EN 60352-2
solder-free/mechanical
metal collar of the crimp sleeves crimped onto core insulation

Normative foundation

DIN EN 61238-1 (VDE 0220)

DIN EN 60352-2

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