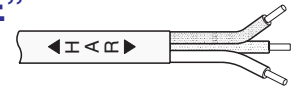


EUROPEAN APPROVED FLEXIBLE CORDAGE AND HOOK UP WIRE HARMONIZED (HAR) APPROVED AND CONFORMS TO "CE"



Harmonized cables are utilized on electronic and electrical equipment that is intended for use in Europe.

For years, European trade was very cumbersome since most countries required compliance to their own electrical standards. In order to facilitate export trade to the European communities, and develop a common European marketplace, an international safety standards agency called the European Committee for Electrotechnical Standardization (CENELEC) was formed to develop electrical standards that would be universally acceptable to all CENELEC member nations which are noted in the table below.

The electrical standards are classified as Harmonization Documents. "HAR" cordage and hook-up wire conforms to Harmonization Documents HD-21 and HD-22:

HD-21 Specification for Polyvinyl chloride insulated wire and cables.

HD-22 Specification for rubber insulated flexible cords and cables.

Compliance with these standards demands the use of Harmonized products on equipment operating in all CENELEC member countries. Additionally, Underwriters Laboratories (UL)

approved the use of HAR cables on equipment for use outside the United States.

In order to identify a harmonized wire or cable, one of the following identification methods are employed: (1) Printed letters (HAR) on either the overall jacket or conductor insulation, or (2) Printed tape or identification threads.

Recommended applications as defined in the Harmonization Documents are as follows:

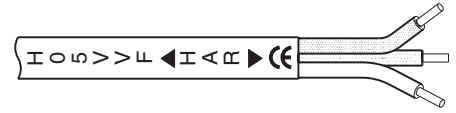
- Polyvinyl Chloride Cord (H05VV-F) - for use in offices, domestic premises, kitchens, household appliances, washing machines, spin dryers, refrigerators. Permitted for cooking and heating appliances, providing cable not in contact with hot parts and is not subject to radiation (UNSUITABLE FOR OUTDOOR USE).
- Rubber Cord (H07RN-F) - for use when cable subjected to mechanical stresses in dry and damp areas. Use as power for transportable motors, appliances, domestic electric tools and electrical tools such as circular saws, agricultural use, and utility water equipment. Can be installed on plaster and direct installation on structural parts of hoist and other heavy machines.

HARMONIZED WIRE CODING SYSTEM	LICENSING BODIES OF CENELEC	
<p>1 2 3 4 5 - 6 7 8 9</p> <p>1. BASIC TYPE H Harmonized Type A National Type</p> <p>2. WORKING VOLTAGE 03 300/300 Volt 05 300/500 Volt 07 450/750 Volt</p> <p>3. INSULATING V PVC R Rubber S Silicone Rubber</p> <p>4. SHEATH-CLADDING MATERIAL V PVC R Rubber N Chloroprene Rubber J Glass-filament Braiding T Textile Braiding</p> <p>5. SPECIAL FEATURES H Ribbon Cable, Separable H2 Ribbon Cable, Non-Separable</p> <p>6. CONDUCTOR TYPES U Single Wire R Multi-Wire K Fine Wire (Permanently Installed) F Fine Wire (Flexible) H Superfine Wire Y Tinsel Strand</p> <p>7. NUMBER OF CORES Number of Cores</p> <p>8. PROTECTIVE CONDUCTOR X Without Protective Conductor G With Protective Conductor</p> <p>9. CONDUCTOR CROSS-SECTIONAL</p>	<p>AUSTRIA</p> <p>BELGIUM</p> <p>DENMARK</p> <p>FRANCE</p> <p>FEDERAL REPUBLIC OF GERMANY</p> <p>FINLAND</p> <p>GREECE</p> <p>IRELAND</p> <p>ITALY</p> <p>NETHERLANDS</p> <p>NORWAY</p> <p>PORTUGAL</p> <p>SPAIN</p> <p>SWEDEN</p> <p>SWITZERLAND</p> <p>UNITED KINGDOM</p>	<p>Osterreichischer Verband for Elektrotechnik (OVE)</p> <p>Comite' Electrotechnique Belge (CEBEC)</p> <p>Denmarks Elektriske Materiel Kontrol (DEMKO)</p> <p>Union Technique de l' Electricite' (UTE)</p> <p>Verband Deutscher Elektrotechniker (VDE) e.V. Prufstelle</p> <p>Electrical Inspectorate (SETI)</p> <p>Hellenic Organization for Standardization (ELOT)</p> <p>National Standards Authority of Ireland (NSAI)</p> <p>Istituto Italiano del Marchio di Qualita (IMQ)</p> <p>N.V. tot Keuring van Elektrotechnische Materialen (KEMA)</p> <p>NEMKO</p> <p>Institute Portugues Da Qualidade (IPQ)</p> <p>Asociacion Electrotecnica Y Electronica Espanola</p> <p>Svenska Elektriska Materiel Kontrollanstalten (SEMKO)</p> <p>Schweizerischer Elektrotechnischer Verein (SEV)</p> <p>B.A.S.E.C. - British Approvals Service for Electric Cables Ltd.</p>



H05VV-F European PVC Flexible Cordage

HAR 300/500 V 70°C IEC, CEE Color Code, "CE" MARK



HAR indicates acceptance by: Austria, Belgium, Denmark, Federal Republic of Germany, Finland, France, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Applications:

For use on electronic and electrical equipment designed for export to Europe. Applicable to UL subject 478 (114) Appendix A - Information processing and business equipment intended for use outside of the U.S.A. Commonly used on appliances and office machines.

Construction:

Bare copper conductors, PVC insulation, conductors cabled, talc, black or gray PVC jacket.

Standards:

HD 21.1 S2, HD 21.2 S2, HD 21.3 S2, HD 308, 361, 383, 385, 402, 405.1. VDE 0100, 0281, 0293, 0295 class 5. IEC 227.1, 227.2, 227.5, 228, 304, 332.1, 540. BS 6500, BS 6360.

Technical Data:

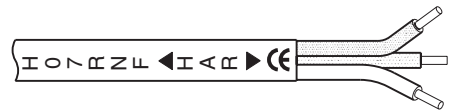
Voltage Rating: 300/500 Volts
 Temperature Rating: -15° C to +70° C
 Minimum Bending Radius for Flexing: 15 x Outer Diameter
 Conductor Color Code: 2 = Blue, Brown
 3 = Green/Yellow, Blue, Brown
 4 = Green/Yellow, Brown, Black, Grey
 5 = Green/Yellow, Blue, Brown, Black, Grey

Approval: HAR

BLACK JACKET CATALOG No.	GRAY JACKET CATALOG No.	NUMBER OF CONDUCTORS	O.D. NOMINAL	BLACK JACKET CATALOG No.	GRAY JACKET CATALOG No.	NUMBER OF CONDUCTORS	O.D. NOMINAL
18 AWG (24/32) 0.75 mm²				16 AWG (30/30) 1.5 mm²			
1601103	810965	2	.248"	1601114	810971	2	.315"
1601102	810618	3	.264"	1601111	810617	3	.350"
1601126	810966	4	.295"	1601116	810675	4	.394"
810976	810967	5	.334"	1601123	810972	5	.433"
17 AWG (32/32) 1.0 mm²				14 AWG (50/30) 2.5 mm²			
1601106	810968	2	.271"	1601121	810973	2	.374"
1601109	810616	3	.299"	1601125	810974	3	.425"
1601119	810969	4	.334"	1601135	810676	4	.463"
1601129	810970	5	.360"	1601112	810975	5	.499"

H07RN-F European Rubber Flexible Cordage

HAR 450/750 V 60°C IEC, CEE Color Code, "CE" MARK



HAR indicates acceptance by: Austria, Belgium, Denmark, Federal Republic of Germany, Finland, France, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and UK.

Applications:

For use on electronic and electrical equipment designed for export to Europe. Applicable to UL subject 478 (114) Appendix A - Information processing and business equipment intended for use outside of the U.S.A.

Construction:

Bare copper conductors, natural or synthetic rubber insulation, talc, conductors cabled, neoprene jacket (black).

Standards:

HD 22.4S2, HD 308, 361, 383, 385, 402, 405.1. IEC 245.4, 228, 0295 class 5, 245, IEC 66, 304, 332-1, 540, 0282. BS 6500, BS 6360.

Technical Data:

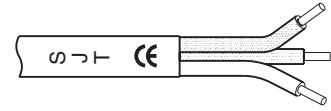
Voltage Rating: 450/750 Volts
 Temperature Rating: -30° C to +60° C
 Minimum Bending Radius for Flexing: 15 x Outer Diameter
 Conductor Color Code: 2 = Blue, Brown
 3 = Green/Yellow, Blue, Brown
 4 = Green/Yellow, Brown, Black, Grey
 5 = Green/Yellow, Blue, Brown, Black, Grey

Approval: HAR

CATALOG NUMBER	NUMBER OF CONDUCTORS	OUTER DIA. MIN.-MAX.	CATALOG NUMBER	NUMBER OF CONDUCTORS	OUTER DIA. MIN.-MAX.
17 AWG (32/32) 1.0 mm²			8 AWG (80/26) 10 mm²		
1600117	3	.338"-.452"	1600121	3	.787"-.1.004"
16 AWG (30/30) 1.5 mm²			1600108	4	.846"-.1.102"
1600103	3	.378"-.492"	1600109	5	.944"-.1.200"
1600123	4	.413"-.531"	6 AWG (126/26) 16 mm²		
1600104	5	.452"-.590"	1600122	3	.886"-.1.161"
14 AWG (50/30) 2.5 mm²			1600110	4	.964"-.1.259"
1600118	3	.452"-.571"	1600111	5	1.063"-.1.397"
1600105	4	.492"-.610"	4 AWG (196/26) 25 mm²		
1600129	5	.531"-.669"	1600112	4	1.161"-.1.476"
12 AWG (56/28) 4 mm²			1600113	5	1.279"-.1.633"
1600119	3	.512"-.630"	2 AWG (296/26) 35 mm²		
1600106	4	.571"-.708"	1600114	4	1.299"-.1.653"
1600130	5	.629"-.767"	1 AWG (396/26) 50 mm²		
10 AWG (84/28) 6 mm²			1600115	4	1.496"-.1.909"
1600120	3	.571"-.787"	2/0 AWG (360/24) 70 mm²		
1600107	4	.649"-.866"	1600116	4	1.692"-.2.145"
1600131	5	.708"-.964"	3/0 AWG (475/24) 95 mm²		
			1600128	4	1.929"-.2.381"



"UNIVERSAL" SJT PORTABLE CORDAGE, 105°C
UL, CSA, VDE, DEMKO, SEMKO, NEMKO Listed, "CE" MARK
300 Volt



Construction:

Bare copper conductors, black jacket.

Outer Jacket Marked:

H05VV-F 3G, SJT, 105°C, VW-1, FT2

Technical Data:

Voltage Rating: 300 Volts
 Temperature Rating: 105° C
 Conductor Color Code: Green with Yellow, Brown, Blue
 Approvals: UL listed (File E-90165)
 CSA listed (File LL57355)
 VDE listed (File 104076)
 "CE" Mark

CATALOG NUMBER	NO.	CONDUCTORS		NOMINAL DIMENSIONS			AMPS	STANDARD LENGTHS	WEIGHT LBS./M FT.
		AWG	STRANDING	INSULATION	JACKET	OUTSIDE DIA.			
1601318	3	18	41/0.16	0.76 mm	0.76 mm	7.9 mm	10	500 FT. COIL	65
1601316	3	16	26/0.254	0.76 mm	0.76 mm	8.5 mm	13	500 FT. COIL	82
1601314	3	14	41/0.254	0.76 mm	0.76 mm	9.3 mm	15	500 FT. COIL	102
1601312	3	12	65/0.254	0.76 mm	1.14 mm	10.5 mm	20	500 FT. COIL	163
1601310	3	10	65/0.32	1.14 mm	1.52 mm	14.7 mm	30	328 FT. COIL	253

NOTE: Stranding and outside diameter dimensions are subject to change without prior notice.



**UL / CSA / <HAR> HOOK UP WIRE
H05 V-K, UL Style 1007, CSA TEW
H07 V-K, UL Style 1015, CSA TEW**



HAR indicates acceptance by: Austria, Belgium, Denmark, Federal Republic of Germany, Finland, France, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

UL, CSA indicates acceptance in the United States and Canada.

Applications:

Recommended for use in electronics and electrical equipment designed for North America and Europe.

One standard product with all the required approvals for the North American and European markets.

Construction:

Stranded copper conductor, PVC insulation.

Approvals:

HAR: H05 V-K
UL: Awm Style 1007, 1569
CSA: TR-64
HAR: H07 V-K
UL: Awm Style 1015
CSA: TEW

Technical Data:

Voltage Rating:

UL / CSA 300V, (H05V-K) 300/500 V
UL / CSA 600V, (H07V-K) 450/750 V

Temperature Rating:

HAR / IEC -5°C to +70°C
UL/CSA to 1 mm² -10°C to +80°C
UL/CSA from 1.5 mm² -10°C to +105°C

Minimum Bending Radius For Flexing:

(H05V-K) 12.5 x O.D.
(H07V-K) 15 x O.D.

Colors Available:

See chart below

CAT. NO.	CONDUCTOR SIZE	NOM.-O.D. inches	COLOR NO.
H05V-K PVC			00 GREEN / YELLOW
9510..1	22 AWG / 0.5 mm ²	0.087	01 BLACK
9510..2	20 AWG / 0.75 mm ²	0.094	02 BLUE
9510..3	18 AWG / 1.0 mm ²	0.098	03 BROWN
H07V-K PVC			04 RED
9520..1	16 AWG / 1.5 mm ²	0.130	05 WHITE
9520..2	14 AWG / 2.5 mm ²	0.150	06 GRAY
9520..3	12 AWG / 4.0 mm ²	0.169	07 VIOLET
9520..4	10 AWG / 6.0 mm ²	0.193	08 PINK
9520..5	8 AWG / 10 mm ²	0.268	09 ORANGE
9520..6	6 AWG / 16 mm ²	0.335	11 YELLOW *
9521..1	4 AWG / 25 mm ²	0.402	12 GREEN *
9521..2	2 AWG / 35 mm ²	0.461	* = NOT HAR

The complete part number is determined by adding the color number to the part number.

Example:

Part number 9510..1 with Green / Yellow insulation is ordered as part number 9510001.



EUROPEAN HOOK UP WIRE

Types H05 V-K, H07 V-K



< HAR >
300/500V 70°C
450/750V 70°C

HAR indicates acceptance by: Austria, Belgium, Denmark, Federal Republic of Germany, Finland, France, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Applications:

For use in electronic and electrical equipment designed for export to Europe. Also used in the repair of machinery originally manufactured in Europe.

Standards:

HD 21.1 S2, HD 21.2, HD 21.3 S2; HD 308, 361, 383, 385, 402, 405.1. VDE 0812 (H05), 028 (H07), 0295 CLASS 5, IEC 227.1, 227.2, 227.5, 228, 304, 332-1, 540. BS 6500. DIN 57281, 57250.

Construction:

Stranded copper conductor, PVC insulation.
 Fine wire per VDE 0295

Technical Data:

Voltage Rating:	(H05V-K) 300/500 V (H07V-K) 450/750 V
Temperature Rating:	(H05V-K) -30°C to +70°C (H07V-K) -30°C to +70°C
Minimum Bending Radius For Flexing:	(H05V-K) 12.5 x O.D. (H07V-K) 15 x O.D.
Colors Available:	See chart below
Approval:	HAR - Conforms to "CE" low voltage directives

CAT. NO.	CONDUCTOR SIZE	NOM. O.D. inches	COLOR NO.
H05V-K PVC			00 GREEN / YELLOW
4510..1	20 AWG (16/32) 0.5 mm ²	0.083	01 BLACK
4510..2	18 AWG (24/32) 0.75 mm ²	0.094	02 BLUE
4510..3	17 AWG (32/32) 1 mm ²	0.102	03 BROWN
H07V-K PVC			04 RED
4520..1	16 AWG (30/30) 1.5 mm ²	0.118	05 WHITE
4520..2	14 AWG (50/30) 2.5 mm ²	0.146	06 GRAY
4520..3	12 AWG (56/28) 4 mm ²	0.169	07 VIOLET
4520..4	10 AWG (84/26) 6 mm ²	0.193	08 PINK
4520..5	8 AWG (80/26) 10 mm ²	0.256	09 ORANGE
4520..6	6 AWG (128/26) 16 mm ²	0.315	10 TRANSPARENT *
4521..1	4 AWG (200/26) 25 mm ²	0.386	11 YELLOW *
4521..2	2 AWG (280/26) 35 mm ²	0.433	12 GREEN *
4521..3	1 AWG (400/26) 50 mm ²	0.512	13 BEIGE
4521..4	2/0 AWG (560/26) 70 mm ²	0.610	14 DARK BLUE
4521..5	3/0 AWG (485/24) 95 mm ²	0.669	
4521..6	4/0 AWG (514/24) 120 mm ²	0.776	
4521..7	300 MCM AWG (765/24) 150 mm ²	0.839	
4521..8	370 MCM AWG (944/24) 185 mm ²	0.925	
4521..9	480 MCM AWG (1255/25) 240 mm ²	1.079	

*** = NOT HAR**

The complete part number is determined by adding the color number to the part number.

Example:

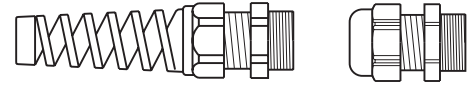
Part number 4510..1 with Green / Yellow insulation is ordered as part number 4510001.

<HAR> Green / Yellow Ground: For every 15 mm of length of insulation, one of the colors (green or yellow) must cover at least 30% and not more than 70% of the insulation surface, the other color covering the remainder.



STRAIN RELIEF CORD CONNECTORS

Liquid-Tight (IP 68) UL, CSA, VDE



Patented Security:

Patent No. P-2631996

International Approvals:

UL No. E79903 VDE No. 57986
CSA No. LR50370-10 SEV No. 100989

Technical Data:

Protection:	Up to 70 PSI
Material:	Polyamide — flame retardant, self-extinguishing nylon with neoprene gland.
Working Temperature:	-22°F (-30°C) to 212°F (100°C) and up to 302°F (150°C) for short periods of time.
Seal:	IP 68 (International Protection — highest grade), comparable to NEMA 6 classification. First digit (0-6): Dust Protection Second digit (0-8): Water Spray Protection
Resistant to:	Salt water, weak acids, weak alkalis, alcohol, ester, ketones, ether, benzene, gas, mineral oil, animal and vegetable oils, gasoline, oil, grease and common solvents.

New technically advanced features meet the most stringent demands of safety and operational reliability. Can be used in - panels, switches, control equipment and is most commonly used within the machine tool industry. A strain relief and a liquid-tight seal — all in one connector.

Internationally Approved:

Internationally tested and accepted by: UL, CSA, VDE, SEV.

Optimum Seal:

A special interior flange construction of two sealing rings molded at the body of the gland plus a high quality neoprene bushing are additional safeguards that insure an impervious seal — NEMA 6 Classification.

Unique Design:

Outperforms traditional connectors because the design consists of three parts which do not require dismantling before use.

The internal ratchet mechanism allows the cap to be tightened without twisting the cord as it compresses, pushing the collet fingers together to form a liquid-tight seal with the neoprene compression gland.

Vibration-Proof Protection:

An integrated locking mechanism that includes an internal ratchet inside the sealing portion of the connector provides a self-locking and vibration-proof fixing element that prevents the cap from detaching even when subjected to severe vibration.

Quick Installation:

New multi-trapezoidal thread requires just one twist to tighten the dome cap — automatically adjusting to the size of the cable and providing optimum strain relief and liquid-tight seal.

Heavy Duty Design:

- Higher pull out strength
- Highly reliable strain relief

New Cap Design for Easier Handling:

Larger ergonomic design and ridges of the dome cap makes for easy gripping and mounting by hand or wrench.

Larger Variable Clamping Range:

The uniquely designed collet accommodates a broad range of cords, tubes and cable diameters resulting in a reduction in the number of glands required in inventory.

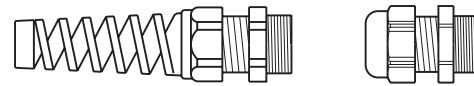
Resistant to Impact at Low Temperatures:

Can withstand impact at low temperatures of -30°C.



STRAIN RELIEF CORD CONNECTORS

Liquid-Tight (IP 68) UL, CSA, VDE



STANDARD TYPE

LOCKING NUT

FLEX TYPE

THREAD SIZE*	MAJOR DIAMETER mm	PITCH mm
PG 07	12.5	1.27
PG 09	15.2	1.41
PG 11	18.6	1.41
PG 13.5	20.4	1.41
PG 16	22.5	1.41
PG 21	28.3	1.59
PG 29	37.0	1.59
PG 36	47.0	1.59
PG 42	54.0	1.59
PG 48	59.3	1.59

* Steel Conduit Thread 10 per DIN 40430

NOTE: Last 2 digits of catalog number indicate "PG" thread size as per above table

CATALOG NUMBER (BLACK)	DIAMETER RANGE	"A" MOUNTING HOLE CLEARANCE	"B" MAXIMUM OVERALL LENGTH	"C" THREAD LENGTH	"D" WRENCHING NUT THICKNESS	"E" WRENCHING FLATS	"F" LOCKNUT THICKNESS	"G" LOCKNUT DIAMETER
METRIC PG THREAD - STANDARD TYPE								
20607	.079-.197	.492	1.259	.315	.203	.591	.197	.827
20507	.118-.255	.492	1.259	.315	.203	.591	.197	.827
20609	.079-.236	.599	1.378	.315	.218	.750	.197	.945
20509	.157-.314	.599	1.378	.315	.218	.750	.197	.945
20611	.157-.275	.733	1.500	.315	.218	.866	.197	1.024
20511	.200-.394	.733	1.500	.315	.218	.866	.197	1.024
20613	.341-.354	.804	1.614	.354	.218	.945	.236	1.142
20513	.236-.472	.804	1.614	.354	.218	.945	.236	1.142
20616	.423-.481	.886	1.732	.394	.234	1.063	.236	1.300
20516	.394-.551	.886	1.732	.394	.234	1.063	.236	1.300
20621	.481-.617	1.115	1.929	.433	.250	1.299	.276	1.535
20521	.545-.709	1.115	1.929	.433	.250	1.299	.276	1.535
20629	.511-.787	1.457	2.165	.433	.297	1.654	.276	1.968
20529	.708-.984	1.457	2.165	.433	.297	1.654	.276	1.968
20636	.787-1.023	1.850	2.519	.512	.315	2.087	.315	2.598
20536	.866-1.259	1.850	2.519	.512	.315	2.087	.315	2.598
20642	.984-1.220	2.126	2.638	.512	.360	2.362	.315	2.874
20542	1.259-1.496	2.126	2.638	.512	.360	2.362	.315	2.874
20648	1.141-1.378	2.335	2.717	.551	.360	2.559	.315	3.071
20548	1.456-1.732	2.335	2.717	.551	.360	2.559	.315	3.071
METRIC PG THREAD - FLEX TYPE								
21707	.079-.197	.492	2.560	.315	.203	.591	.197	.827
20707	.118-.255	.492	2.560	.315	.203	.591	.197	.827
21709	.079-.236	.599	2.970	.315	.218	.750	.197	.945
20709	.157-.314	.599	2.970	.315	.218	.750	.197	.945
21711	.157-.275	.733	3.510	.315	.218	.866	.197	1.024
20711	.200-.394	.733	3.510	.315	.218	.866	.197	1.024
21713	.341-.354	.804	4.020	.354	.218	.945	.236	1.142
20713	.236-.472	.804	4.020	.354	.218	.945	.236	1.142
21716	.423-.481	.886	4.540	.394	.234	1.063	.236	1.300
20716	.394-.551	.886	4.540	.394	.234	1.063	.236	1.300
21721	.481-.617	1.115	5.293	.433	.250	1.299	.276	1.535
20721	.545-.709	1.115	5.293	.433	.250	1.299	.276	1.535

ALL DIMENSIONS ARE IN INCHES

