# 400 Hz CABLES

# FOR GROUND POWER SUPPORT



#### **About Us**



SAB North America is a focused supplier for the automation, aerospace, medical, high temperature, and robotics industries, providing cable and thermocouple solutions that meet, exceed, and set new standards in the flexible cable market. In addition to flexible cable products, we offer an extensive inventory of high-quality cable accessories, including cord grips, grounding glands and other accessories that complement our flexible control and automation cables.

Whatever the need may be, look to SAB North America for Special Cables that can, for example, help minimize maintenance costs and increase productivity, reduce downtime, and solve specific problems. Here is a small sample of some of the challenges that Special Cables from SAB North America can help address:

- Hybrid designs for multiple functions
- Harsh environments
- Difficult applications
- Industry-specific requirements



Cables deployed in airports, such as those that operate inside boarding bridges, need rugged construction to withstand the rigors of this unique environment. That's why airport operators must be able to count on a single source for wire and cable that also has a deep understanding of airport equipment and infrastructure. SAB North America cables are built to operate reliably in boarding bridges and a host of other airport machines. SAB has more than 75 years of experience manufacturing quality, rugged cables for challenging applications, so you can be sure passengers will be comfortable and operations will run safely and smoothly.

Whether you're a valued distribution partner, a manufacturer, an automation house, an integrator, or a contractor, rest assured that our cables are reliable to maximize production efficiencies. SAB brings world class performance & 75 years of ingenuity to the table.

SAB's level of speed and service as a supplier is unmatched. SAB lives up to its name in not only flexible cable but also flexible manufacturing.







#### SAB Advantage...We make it Easy

- Engineering & technical assistance
- Cut to length with no cut charges
- Prepaid freight within US for orders over \$2,500
- Specialty cable designs (1500 ft minimum)

- No minimum on orders from stock
- Free drop shipments (no surcharges)
- 24-hour shipments from stock
- Cord Grips for securing and grounding cables



# 400 Mz Ground Power Cables

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Ready-to-connect ground power cables with connectors						

#### Airport equipment:

SAB offers a broad range of cables for airport facilities such as passenger bridges, as well as for continuously flexible applications, wiring cable or for use in bus systems. Our innovative, durable cables stand up to the unique needs of airport equipment and infrastructure.

#### Ground power equipment:

Cables used in ground power units (GPU) and ground support equipment (GSE) must stand up to weather, oils and abrasion. And, changing conditions at runways demand easy connection and installation. Our 400 Hz cables are well-suited for fixed laying, flexible or reeling applications in GPU and GSE systems. These durable cables are also available as plug-and-play devices, harnessed with 400 Hz plugs for different suppliers. One such cable, the GP400 QF power cable with integrated control cores, features flexible, smooth construction for easy handling, plus our SABIX® insulation. It can also be suspended under boarding bridges.







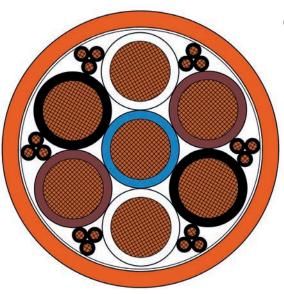


# 400 Mz Ground Power Cables

# **GP 400 Sy**

400 Hz Ground Power Supply Cable - Symmetrical





CE ERE ROHS

Application: For use as fixed installed cable in 400 Hz systems, e.g. between 400 Hz generator and cable dispenser

	Construction:			
Conductor:	bare copper strands			
Insulation:	2 AWG: PVC 18 AWG: SABIX <sup>®</sup>			
Color code:	control conductors: black with numbers 1 - 18 neutral conductor: blue phase conductor: white, brown, black (two conductors of the same color for the phase)			
Stranding:	phase conductors concentrically around the neutral conductor, control conductor as triple in the interstices			
Jacket material:	PVC			
Jacket color:	orange			
Marking:	SAB BRÖCKSKES · D-VIERSEN · GP 400 S 7x35.0mm²+6x3x1.0mm² 3400-7213 € and current meter marking			



#### Outstanding features:

reduced outer diameter

	Technical data:
Nominal voltage:	Uo/U 0.6/1 kV
Testing voltage:	conductor/conductor: 4000 V AC
Min. bending radius: fixed installation: flexible application:	4 x O.D 8 x O.D
Temperature range: static: flexible:	-40/+70°C +5/+70°C
Approvals:	CE, EAC, RoHS
Absence of harmful substances:	acc. to RoHS directive of the European Union see page O/30

item no.	AWG/c	oute	r-ø mm	cable weight ≈lbs/mft	DC resi at 20 max. 9	0°C	voltage o	·
➤ 34007210 ➤ 34007213	2 AWG / 7c 2 AWG / 7c + 18 AWG / 6x3	1.457 1.457	37 37	2018 2100	2 AWG: 2 AWG: 18 AWG:	0.554 0.554 19.500	2 AWG: 2 AWG: 18 AWG:	1.108 1.108 39.0

Other dimensions and colors are available on request



Also avaliable with 24 control conductors

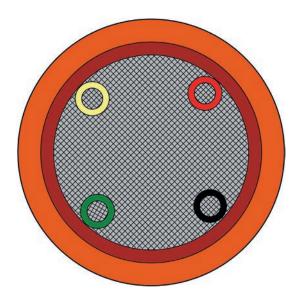


### **GP 400 SC**

400 Hz Ground Power Supply Cable - SingleCore







Application: For use in flexible applications, e.g. on mobile generators, in cable dispensers in the ground or on the passenger bridge.

	Construction:
Conductor:	tinned copper strands
Insulation:	SABIX <sup>®</sup>
Color code:	control conductors: red, black, green, yellow power supply conductor: red
Stranding:	control conductors within the power supply conductor
Jacket material:	PUR
Jacket color:	orange
Marking:	SAB BRÖCKSKES · D-VIERSEN · GP 400 SC 50mm²+4x1.0mm² 34001321 (€ and current meter marking



	Technical data:				
Nominal voltage:	Uo/U 115/200 V				
Max. permissible operating voltage*:	Uo/U 0.6/1 kV				
Testing voltage:	conductor/conductor: 4000 V AC				
Min. bending radius: fixed installation: flexible application:	4 x O.D 6 x O.D				
Temperature range: static: flexible*:	-50/+90°C -40/+90°C				
Halogen-free:	acc. to IEC 60754-1 + VDE 0482-754-1				
Oil resistance:	very good - TMPU acc. to EN 50363-10-2 + VDE 0207-363-10-2				
Weather resistance:	very good				
Approvals:	CE, EAC, RoHS				
Absence of harmful substances:	acc. to RoHS directive of the European Union see page O/30				
* using all wires on one potential					

item no.	AWG/c	out	er-ø	cable weight	DC resistance	voltage d	drop	
		inch	mm	≈lbs/mft	at 20°C max. Ω/km	[mV/(A*m)]		
> 34001321	2 AWG / 1c + 18 AWG/ 4c	0.614	15.6	394	2 AWG: 0.393 18 AWG: 20.000	2 AWG: 18 AWG:	0.786 40.0	
> 34001421	2/0 AWG / 1c + 18 AWG/ 4c	0.697	17.7	538	2/0 AWG: 0.277 18 AWG: 20.000	2/0 AWG: 18 AWG:	0.554 40.0	
> 34001521	3/0 AWG / 1c + 18 AWG/ 4c	0.772	19.6	693	3/0 AWG: 0.210 18 AWG: 20.000	3/0 AWG: 18 AWG:	0.420 40.0	

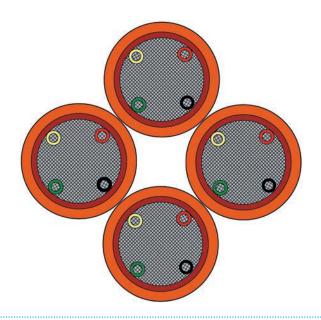


### **GP 400 QF**

400 Hz Ground Power Supply Cable - QuadFlex



C ∈ RoHS



Application: For use in flexible applications, e.g. on mobile generators, in cable dispensers in the ground or on the passenger bridge.

	Construction:			
Conductor:	tinned copper strands			
Insulation:	SABIX <sup>®</sup>			
Color code:	control conductors: red, black, green, yellow power conductor: red			
Stranding:	control conductors within the power supply conductor			
Jacket material:	PUR			
Jacket color:	orange			
Stranding:	openly stranded			
Marking:	SAB BRÖCKSKES · D-VIERSEN · GP 400 QF 4x(50mm²+4x1.0mm²) 34004321 L1 resp. L2 resp. L3 resp. N C6 and current meter marking			



	Technical data:					
Nominal voltage:	Uo/U 115/200 V					
Max. permissable operating voltage*:	Uo/U 0.6/1 kV					
Testing voltage:	conductor/conductor: 4000 V AC					
Min. bending radius: fixed installation: flexible application:	4 x O.D 6 x O.D					
Temperature range: static: flexible*:	-50/+90°C -40/+90°C					
Halogen-free:	acc. to IEC 60754-1 + VDE 0482-754-1					
Oil resistance:	very good - TMPU acc. to EN 50363-10-2 + VDE 0207-363-10-2					
Weather resistance:	very good					
Approvals:	CE, EAC, RoHS					
Absence of harmful substances:	acc. to RoHS directive of the European Union see page O/30					
* using all wires on one potential						

item no.	AWG/c	out inch	ter-ø mm	cable weight ≈lbs/mft	at	esistance 20°C . Ω/km	voltage [mV/(	·
> 34004321	4 x (2 AWG + 4 x 18 AWG)	1.476	37.5	1613	2 AWG: 18 AWG:	0.393 20.000	2 AWG: 18 AWG:	0.786 40.0
> 34004421	4 x (2/0 AWG + 4 x 18 AWG)	1.673	42.5	2193	2/0 AWG: 18 AWG:	0.277 20.000	2/0 AWG: 18 AWG:	0.554 40.0



#### **GP 400 7F**

400 Hz Ground Power supply cable - SevenFlex







Application: Symmetrical cable with high flexibility. Minimum bending radius (easy to coil even in tight spaces) and high quality electrical performance (low voltage drop and low voltage unbalance). Can be used in long lengths.

	Construction:
Conductor:	tinned copper strands
Insulation:	SABIX®
Color code:	control conductors: red, black, green, yellow power supply conductor: red
Stranding:	control conductors within the power supply conductor
Jacket material:	PUR
Jacket color:	orange
Stranding:	openly stranded
Marking:	SAB BRÖCKSKES · D-VIERSEN · Special GP 400 35.0mm²+4x1.0mm² 34009006 € and current meter marking



	Technical data:					
Nominal voltage:	Uo/U 0.6/1kV					
Testing voltage:	conductor/conductor: 4000 V AC					
Min. bending radius: fixed installation: flexible application:	4 x O.D 6 x O.D					
Temperature range: static: flexible*:	-50/+90°C -40/+90°C					
Approvals:	CE, RoHS					
Absence of harmful substances:	acc. to RoHS directive of the European Union see page O/30					

item no.	AWG/c	outer-ø		cable	DC resistance		voltage drop	
		inch	mm	weight ≈lbs/mft	at 20°C max. Ω/km		[mV/(A*m)]	
> 34009006	2 AWG / 7c + 18 AWG/ 4c	1.58	40.2	1995	2 AWG: 18 AWG:	0.554 19.5	2 AWG: 18 AWG:	1.108 39.0

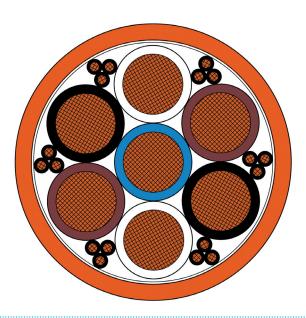


#### **GP 400 SF**

400 Hz Ground Power supply cable - SymmetricalFlex







Application: For use as fixed cable with particularly good laying ability or for flexible use without high mechanical stress, e.g. in slow moving drag chains on passenger boarding bridges. Optimized flexibility due to flexible core and jacket materials, thus easy installation and easy handling in the cable dispenser. Depending on the operating conditions, it can also be used as a direct supply line to the aircraft with a connector.

	Construction:
Conductor:	bare copper strands
Insulation:	SABIX <sup>®</sup>
Color code:	control conductors: black with numbers 1 - 18 neutral conductor: blue phase conductor: white, brown, black (two conductors of the same color for the phase)
Stranding:	Phase conductors concentrically around neutral core, control cores as tripple in the interstices, triple wrapped with non-woven tape, all elements twisted in specially adjusted layers, non-woven tape overlapping wrapped
Jacket material:	special compound
Jacket color:	orange
Marking:	SAB BRÖCKSKES · D-VIERSEN · GP 400 SF 7x35.0mm²+6x3x1.0mm² 34007223 € and current meter marking

	7x35.0mm²+6x3x1.0mm² 34007223 € and current meter marking
	Outstanding features:
	low capacity insulation very smooth handling also usable as a supply cable directly on the aircraft
•	very good installation in the smallest possible space

	Technical data:
Nominal voltage:	Uo/U 0.6/1 kV
Testing voltage:	conductor/conductor: 4000 V AC
Min. bending radius: fixed installation: flexible application:	4 x O.D 6 x O.D
Temperature range: static: flexible:	-40/+70°C -20/+70°C
Approvals:	CE, EAC, RoHS
Absence of harmful substances:	acc. to RoHS directive of the European Union see page O/30



Also avaliable with 24 control conductors

item no.	AWG/c	outer-ø		cable	DC resistance	voltage drop	
		inch	mm	weight ≈lbs/mft	at 20°C max. Ω/km	[mV/(A*m)]	
<b>3</b> 4007123	7 x 4 AWG + (6x3 x 18 AWG)	1.276	32.4	1509	4 AWG: 0.780	4 AWG: 1.560	
					18 AWG: 19.500	18 AWG: 39.0	
> 34007223	7 x 2 AWG + (6x3 x 18 AWG)	1.661	42.2	1972	2 AWG: 0.544	2 AWG: 1.108	
					18 AWG: 19.500	18 AWG: 39.0	

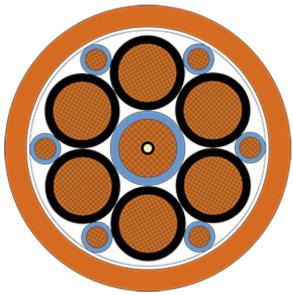


# GP 400 SF S Supply Cable

400 Hz Ground Power Supply Cable







Application: For the application as cable track cables in energy supply chains or as Festoon cable on passenger boarding bridges.

	Construction:
Conductor:	tinned copper strands
Insulation:	SABIX <sup>®</sup>
Color code:	16 AWG: blue 2 AWG: black with numbers, 2 x 1-3 blue
Stranding:	2 AWG: neutral core with strain relief in the core, wrapped with non-woven tape
Wrapping:	non-woven tape
Jacket material:	PUR
Jacket color:	orange
Marking:	SAB BRÖCKSKES · D-VIERSEN · GP 400 SF S 7x35,0mm²+6x6,0mm² 34006230 € and current meter marking



item no.	AWG	outer-ø		cable	DC resist	
		inch	mm	weight ≈lbs/mft	at 20° max. Ω/	-
▶ 34006230	16 AWG/7c + 2 AWG/6	1.50	38	2132	2 AWG: 16 AWG:	0.565 3.39

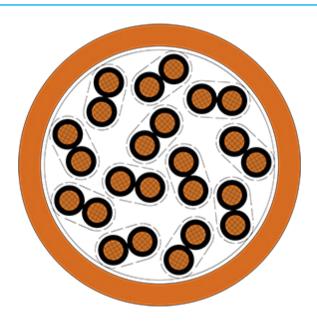
Uo/U 0.6/1 kV Nominal voltage: conductor/conductor: 4000 V AC Testing voltage: Min. bending radius: continuously flexible: Temperature range: -50/+90°C static: flexible: -40/+90°C CE, RoHS Approvals: Absence of acc. to RoHS directive of the European Union harmful substances: see page O/30

Technical data:



# **GP 400 SF S Control Cable**

400 Hz Ground Power Control Cable



Application: For the application as cable track cables in energy supply chains or as Festoon cable on passenger boarding bridges.

	Construction:
Conductor:	bare copper strands, fine wires
Insulation:	SABIX <sup>®</sup>
Color code:	black with numbers: 1-24
Stranding:	conductors twisted to pairs, optimized twisting of pairs in layers
Jacket material:	PUR
Jacket color:	orange
Marking:	SAB BRÖCKSKES · D-VIERSEN · GP 400 SF S 12x2x1,5mm² 34009028 C€ and current meter marking

Outstanding features:
low capacity insulation abrasion resisistant PUR jacket cold flexible halogen-free oil resistant weather resistant

item no.	AWG/prs	outer-	outer-ø		DC resistance
		inch	mm	weight ≈lbs/mft	at 20°C max. Ω/km
<b>▶</b> 34009028	16 AWG/12pr	0.906	23	323	16 AWG: 13.7

Technical data: 300/500 V Nominal voltage: conductor/conductor: 4000 V AC Testing voltage: Min. bending radius: continuously flexible: Temperature range: -50/+90°C static: flexible: -40/+90°C CE, RoHS Approvals: acc. to RoHS directive of the European Union see page O/30 Absence of harmful substances:

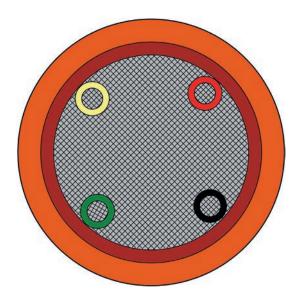


## GP 400 SC DC

Ground Power supply cable 28 V DC - SingleCore Direct Current







Application: For use in flexible applications, e.g. on mobile generators, in cable dispensers in the ground or on the passenger bridge at 28 V DC.

	Construction:
Conductor:	tinned copper strands
Insulation:	SABIX <sup>®</sup>
Color code:	control conductors: red, black, green, yellow power supply conductor: red
Stranding:	control conductors within the power supply conductor
Jacket material:	PUR
Jacket color:	orange
Marking:	SAB BRÖCKSKES · D-VIERSEN · GP 400 SC DC (120mm²+4x1.0mm²) 34001621 C€ and current meter marking



item no.	AWG/c	oute	r-ø mm	cable weight ≈lbs/mft	DC resi at 20 max. 9	0°C	voltage [mV/(A	
> 34001621	4/0 AWG/ 1c + 18 AWG/ 4c	0.874	22.2	894	4/0 AWG: 18 AWG:	0.164 20.000	4/0 AWG: 18 AWG:	0.328 40.0

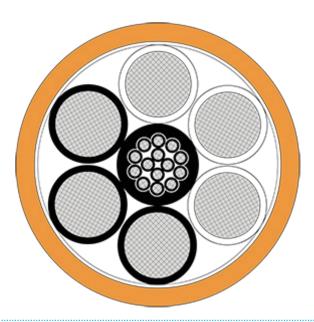
Technical data:
28 V DC
conductor/conductor: 600 V AC
4 x O.D 6 x O.D
-50/+90°C -40/+90°C
acc. to IEC 60754-1 + VDE 0482-754-1
very good - TMPU acc. to EN 50363-10-2 + VDE 0207-363-10-2
very good
CE, RoHS
acc. to RoHS directive of the European Union see page O/30



# **GP 400 SF 28V DC**

400 Hz Ground Power supply cable - 28 V DC





Application: For the application as fixed supply cable with optimised installation or for a flexible hand-held application without elevated mechanical stress for example mobile GPUs. Excellent flexibility due to smooth core and sheath materials make possible an easy laying and handling.

	Construction:	
Conductor:	tinned copper strands, fine wires	
Insulation:	SABIX <sup>®</sup>	
Color code:	1.0 mm <sup>2</sup> : black conductors with consecutive numbers 1 - 14	
	40 mm <sup>2</sup> : white conductors with consecutive numbers 1 - 3, black conductors with consecutive numbers 1 - 3	
Stranding:	in layers	
Jacket material:	PVC	
Jacket color:	orange	
Marking:	SAB BRÖCKSKES · D-VIERSEN · GP 400 SF 28V DC 6x40.0mm²+14x1.0mm² 34009020 C€ and current meter marking	

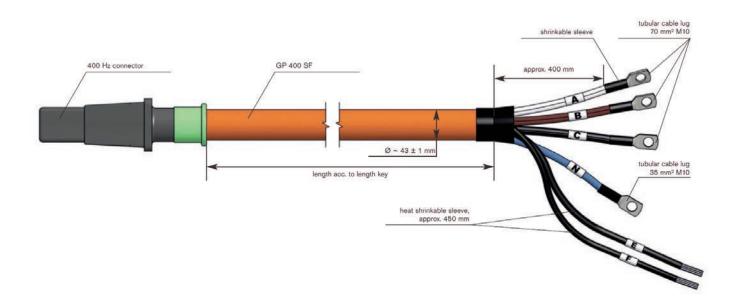
Outstanding features:
low capacity insulation extremely flexible and smooth handling also usable as supply cable on the aircraft itself very good installation in narrowest spaces good resistance characteristics also against wear and tear

	Technical data:	
Nominal voltage:	28 V DC	
Testing voltage:	conductor/conductor: 600 V AC	
Min. bending radius: fixed installation: flexible application:	4 x O.D 6 x O.D	
Temperature range: static: flexible:	-50/+90°C -40/+90°C	
Oil resistance:	acc. to internal standard	
Approvals:	CE, RoHS	
Absence of harmful substances:	acc. to RoHS directive of the European Union see page O/30	

item no.	Dimensions	ou	ter-ø	cable	DC resistance
		inch	mm	weight ≈lbs/mft	at 20°C max. Ω/km
<b>3</b> 4009020	6 x 40.0 + 14 x 1.0	min. 1.417 max 1.496	min. 36	1955	40 mm <sup>2</sup> : 0.500



## SAB 400 Hz cable for mobile GPUs with connectors



#### Pin Assignment:

400 Hz Connector	Cable	Connection Piece	
pin A	2 x wh (35 mm²)	tubular cable lug 70 mm², M10	
pin B	2 x bn (35 mm²)	tubular cable lug 70 mm², M10	
pin C	2 x bk (35 mm²)	tubular cable lug 70 mm², M10	
pin N	1 x bu (35 mm²)	tubular cable lug 35 mm², M10	
pin E	conductors 1-9 (1 mm²)	cores pulled into shrinkable sleeves,	
pin F	conductors 10-18 (1 mm²)	core ends untreated	

#### Weight:

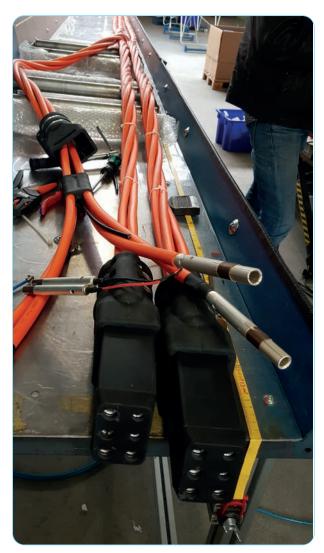
connnector and tubular cable lugs	Cable
approx. 3 kg	approx. 3.2 kg/m

#### Configuration examples:

item no.	length "L" in cm
► \$3400-3003-01000	100
► \$3400-3003-02000	200

# Plug'n'Play - ready harnessed with plug connector

Ready-to-connect ground power cables with plug connectors



SAB also supplies 400 Hz cables ready for installation.

Various 400 Hz connectors available.

- on request also with cable lugs.
- each assembly is packed safely and individually.
- each product is tested for function.
- on request with test report for 100% documentation.









# **Production possibilities**

#### Flexible cables and wires "Made in Germany"

As a leading manufacturer we develop and produce cables for industrial purposes.

Our wide range of materials offer a lot of possibilities for your individual product requirement.

The following survey shows an extract of our production possibilities:

#### **Conductor Materials:**

- bare copper
- tinned copper
- silver plated copper
- nickel plated copper
- nickel
- nickel pure
- compensating cable alloys

#### Insulation and Jacketing Materials:

- PVC
- Polyethylene
- Polypropylene
- Polyurethane
- SABIX® (zero halogen)
- Besilen® Silicone
- FEP, ETFE, PFA, PTFE
- Fiberglass

#### Temperature Ranges:

Thermoplastic Elastomers

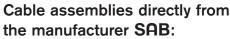
- √-50°C up to +145°C
- √-50°C up to +220°C

Besilen® - Silicone

- √-40°C up to +220°C
- FEP, ETFE, PFA
- √-90°C up to +260°C
- **Fiberglass**
- √up to +600°C

#### Conductors:

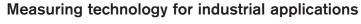
- cross sections 0.055 300 mm<sup>2</sup>
- unshielded and shielded over 100 conductors



As a full service partner, we are able to offer cable design and production as well as the manufacturing of cable assemblie according to customer's request. Please trust on our experience for decades in the treatment of cables and connectors.

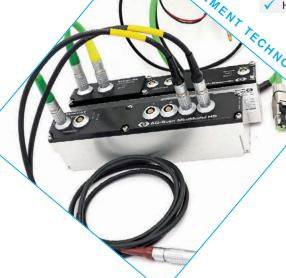
- cable assemblies
- according to customer's demands complete cable assemblies
- UL certified assemblies
- helix cables
- HV measuring assemblies

# CABIE ASSEMBLIES



Manufacturer of temperature sensors for industrial applications with 75 years of experience!

- mineral insulated thermocouples
- mineral insulated resistance thermometers
- temperature sensors
- mobile high voltage measuring technology
- temperature sensors for vehicle testing









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