Connectors

GA Series
Circular connectors to industry standard
Catalogue A25.en
Industrial connectors, GA series

Series GA industrial connectors are high-quality special purpose connectors.

The 15 pole circular connector has a housing made of high strength aluminium magnesium alloy. The contact arrangement is a combination of 4 power contacts and 11 control contacts.

The thermoset contact inserts allow the connector to be used for a wide temperature range. Cable-connecting and flange mount plugs and receptacles with different threads for cable glands are available as stock items. Protection caps are available as accessory. Special variants upon request!

Sealed to IP67/IP69K: The pin contacts and solder cups are moulded watertight in the contact inserts of the receptacles, so that there is no ingress of water even when the connector is unplugged.

The polarized key and keyway construction of the connector prevents the contacts from touching the insulator, thus making possible a “blind” mating of the connector halves. The functional threaded coupling ensures reliable connection.

Features

- High-quality robust metal housing
- 4 power and 11 control contacts
- Functional threaded coupling with polarized key and keyway construction for easy and reliable connection
- Receptacles watertight to IP67/IP69K when mated and unmated
- Resistant to corrosive liquids
- Electrical and mechanical characteristics to IEC 61984

Applications

- Machine tool building
- Test bays
- Custom machine building
- Renewable energy resources

Overview

<table>
<thead>
<tr>
<th>Shell style</th>
<th>Accessory</th>
<th>Shell style</th>
<th>Accessory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable receptacle KD for cable gland Pg21 GA KD 1PL Pg21 for cable gland M25 GA KD 1PL M25</td>
<td>GA KD 1PL M25 page 5 Protection cap for receptacles KD, DF GA VD page 5</td>
<td>Plug (standard) ST for cable gland Pg21 GA ST 1SC Pg21 for cable gland M25 GA ST 1SC M25</td>
<td>GA ST 1SC M25 page 6 Protection cap for plugs ST, SC, SF GA VK page 5</td>
</tr>
<tr>
<td>Flange mount receptacle DF GA DF 1PL for cable gland Pg21 GA DF 1PL M25 page 5</td>
<td>Flange plug SF GA SF 1SC page 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Competence

For decades Schaltbau has been a well-known and competent manufacturer of products designed for use in harsh environments. Typical applications:

- Industry
- Military communications
- Traffic engineering

Based on the success of the proven industrial connectors, the high quality and reliability typical of Schaltbau is being continued by the GA Series.

Standards

- Electrical and mechanical characteristics of connectors in accordance with IEC 61984
- Degree of protection according to IEC 60529 (IP code)
- UL 94-V0 flammability rating of plastics used
### Specifications

#### Series GA Plugs Receptacles

<table>
<thead>
<tr>
<th>Series GA</th>
<th>Plugs</th>
<th>Receptacles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of contacts</td>
<td>3-polig + PE + 11</td>
<td>3-polig + PE + 11</td>
</tr>
</tbody>
</table>

#### Contact arrangement

- **Insert:**
  - **Pin insert:** Rear view
  - **Socket insert:** Front view

#### Contact identification marked on

- **Insert:**
  - **Pin insert:** Rear view
  - **Socket insert:** Front view

#### Rated voltage (IEC 60038)

- at pollution degree 3 (IEC 60512)
  - 400 V / 400 V
  - Earth contact: 25 V / 60 V

#### Orientation / keys and keyways

- 1 / 5

#### Current rating of individual contact, max.

- see page 7
  - 3 x 50 A
  - 11 x 16 A

#### Contact size / type

- Ø 4 mm / Crimp contact, Type C
- Ø 1.58 mm / Crimp contact, Type A
- Ø 4 mm / Solder contact
- Ø 1.58 mm / Solder contact

#### PE contact

- **Contact size / type**
  - Ø 4 mm / Crimp contact, Type C
  - Ø 4 mm / Solder contact

#### Max. rated current of individual contact

<table>
<thead>
<tr>
<th>Wire gauge</th>
<th>0.50 mm²</th>
<th>0.75 mm² .. 1.00 mm²</th>
<th>1.50 mm²</th>
<th>2.50 mm²</th>
<th>4.00 mm²</th>
<th>6.00 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crimp contact, Type A</td>
<td>10 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crimp contact, Type C</td>
<td>16 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crimp contact, Type C</td>
<td>35 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crimp contact, Type C</td>
<td>50 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solder contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### PE contact

- **Wire gauge**
  - 1.50 mm²
  - 4.00 mm²
  - 6.00 mm²

- **Contact resistance (IEC 60512-2)**
  - < 2 mΩ
  - < 10 mΩ

- **Insulation resistance (IEC 60512-2)**
  - > 5,000 MΩ
  - > 5,000 MΩ

- **Temperature range**
  - -25°C ... +60°C

- **Degree of protection** (IEC 60529)
  - Mated: IP67 / IP69K
  - Mated/not mated: IP67 / IP69K

- **Test standard** (IEC 60068-1)
  - tmin°C / tmax°C / ttesting days
  - -25/60/21

- **Mechanical endurance (mating cycles)**
  - (IEC 60512-5, test 9a)
  - 2,000

- **Retention force (crimp contacts)**
  - > 75 Nm

- **Materials**
  - **Shells**
    - Aluminium or PA 66 (only GA SC 1SC xxx)
    - Thermoset
    - Silicone rubber (SIR)
    - UL94V-O
  - **Inserts**
    - Synthetic rubber
    - Perbunan (NBR)
    - UL94V-O

- **Contacts**
  - **Terminal type**
    - Crimp
    - Solder-type copper wrought alloy
  - **Material**
    - Ag
  - **Plating**
    - Ag

- **Contact**
  - **Material**
    - Crimp
    - Solder-type copper wrought alloy
    - Ag

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*1 With reducing bushing RH-6,0/1,5 - included with contacts
*2 With reducing bushing RH-6,0/4,0 - included with contacts
*3 Operating temperatures exceeding 25°C account for a lower current rating, see derating diagram on page 7
*4 Solder contacts are moulded in the contact insert of the receptacle shell

Subject to change
Our GA Series connectors have a modular structure. All components of the connector are shown in the Overview on page 2.

You will find the ordering code for a connector variant as presented in this catalogue in the table opposite its dimension diagram.

- **Ordering code for »plug and receptacle shells«**

<table>
<thead>
<tr>
<th>Series</th>
<th>Designation of series</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shell style (with contact insert 3+PE+11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
</tr>
<tr>
<td>SC</td>
</tr>
<tr>
<td>SF</td>
</tr>
<tr>
<td>KD</td>
</tr>
<tr>
<td>DF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
</tr>
<tr>
<td>S</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Terminal type</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
</tr>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threaded connection for cable gland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pg21</td>
</tr>
<tr>
<td>Pg29</td>
</tr>
<tr>
<td>M25</td>
</tr>
<tr>
<td>M40</td>
</tr>
</tbody>
</table>

- **Ordering code for »Protection caps«**

<table>
<thead>
<tr>
<th>Series</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>VD</td>
</tr>
<tr>
<td>VK</td>
</tr>
</tbody>
</table>

- **Ordering code for »tools«**

<table>
<thead>
<tr>
<th>Extraction tool for contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWZ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>C/H</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crimp tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWZ-600-1</td>
</tr>
</tbody>
</table>

Crimp tool for wire range 0.14 ... 6 mm²

**Note:**

This catalogue shows only stock items. For some variants minimum quantities apply. Please ask for the conditions.

**Special variant:**

If you need a special variant of the connector, please do not hesitate to contact us. Maybe the type of connector you are looking for is among our many special designs. If not, we can also supply customized designs. In this case, minimum quantities apply.
GA KD 1PL xx Cable receptacle

Dimensions

- The solder-type pin contacts are moulded in the insert of the receptacle shell.
- Cable glands are not included in the delivery.

GA DK 1PL Pg21

Example:

Ordering code

- GA KD 1PL Pg21
- GA KD 1PL Pg29
- GA KD 1PL M40

Accessory

- Protection cap GA VD

GA DF 1PL Flange mount receptacle

Dimensions

- The solder-type pin contacts are moulded in the insert of the receptacle shell.
- Gasket included in the delivery.

GA DF 1PL

Example:

Ordering code

- GA DF 1PL

Accessory

- Protection cap GA VD

GA VD / GA VK Protection cap for receptacle / plug

Ordering code

- GA VD
- GA VK

Example:

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA VD</td>
<td>Protection cap for receptacles KD, KF</td>
</tr>
<tr>
<td>GA VK</td>
<td>Protection cap for plugs ST, SC, SF</td>
</tr>
</tbody>
</table>

Note: Protection cap delivered with loose cord end and separate ferrule and eyelet. Optional delivery with loop or attached eyelet (e.g. crimping of ferrule or eyelet with flat pliers).
**GA ST 1ST xx Plug, standard**

Dimensions

<table>
<thead>
<tr>
<th>Ø50.8</th>
</tr>
</thead>
</table>

**Ordering code**

Example:

<table>
<thead>
<tr>
<th>Series</th>
<th>Shell style</th>
<th>Contact arr. / contacts / terminal type</th>
<th>Threaded connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA</td>
<td>Plug, standard</td>
<td>1SC</td>
<td>Pg21</td>
</tr>
</tbody>
</table>

**Accessory**

- Protection cap GA VK

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**GA SC 1SC Plug, short**

Dimensions

<table>
<thead>
<tr>
<th>Ø50.8</th>
</tr>
</thead>
</table>

**Ordering code**

Example:

<table>
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<th>Threaded connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA</td>
<td>Plug, short</td>
<td>1SC</td>
<td>Pg21</td>
</tr>
</tbody>
</table>

**Accessory**

- Protection cap GA VK

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**GA SF 1SF Flange plug**

Dimensions

<table>
<thead>
<tr>
<th>Ø50.8</th>
</tr>
</thead>
</table>

**Ordering code**

Example:

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<th>Shell style</th>
<th>Contact arr. / contacts / terminal type</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA</td>
<td>Flange plug</td>
<td>1SC</td>
<td>GA SF 1SC</td>
</tr>
</tbody>
</table>

**Accessory**

- Protection cap GA VK
**Contacts** Plugs: Crimp contacts, Receptacles: Solder contacts

### Crimp type socket contacts

<table>
<thead>
<tr>
<th># of</th>
<th>Drawing</th>
<th>Contact type</th>
<th>Identification</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3x</td>
<td><img src="image" alt="Crimp, Type C" /></td>
<td>Crimp, Type C</td>
<td>1 wide groove</td>
<td>BCC-600-Ag</td>
</tr>
<tr>
<td>1x</td>
<td><img src="image" alt="Crimp, Type A" /></td>
<td>Crimp, Type A</td>
<td>1 groove</td>
<td>BAC-100-Ag</td>
</tr>
</tbody>
</table>

- *) With reducing bushing RH-6/0.4 - included with contacts
- **) With reducing bushing RH-6/0.1 - included with contacts

### Solder type pin contacts (not replaceable)

<table>
<thead>
<tr>
<th># of</th>
<th>Drawing</th>
<th>Contact type</th>
<th>Identification</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3x</td>
<td><img src="image" alt="Solder" /></td>
<td>Solder</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1x</td>
<td><img src="image" alt="Solder" /></td>
<td>Solder</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

- *) Moulded in the contact insert of the receptacle shell; item cannot be ordered individually

### Derating curve power contacts (3x ○)

![Derating curve](image)

- According to VDE 0298-4 the wire gauge of the conductor should be determined in this way that within the limits of its specified current carrying capacity there will be no heating of the conductor exceeding the permissible operating temperature at any place or any time.
- The derating diagram shows the permissible operating range.
- Control and test procedures according to IEC 60512-3, test 5b.

### Tools Extraction tools AWZ-A and AWZ-C/H, Crimp tool CWZ-600-1

#### AWZ-x Extraction tool

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Extraction tool for</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWZ-A</td>
<td>Extraction tool for contacts, Type A</td>
</tr>
<tr>
<td>AWZ-C/H</td>
<td>Extraction tool for contacts, Type C and H</td>
</tr>
</tbody>
</table>

**Note:** Extraction tool for crimp-type socket contacts as used for plugs BAC-1,00-Ag (Type A) and BAC-6,00-Ag (Type C)

#### CWZ-600-1 Crimp tool

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Crimp tool for</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWZ-600-1</td>
<td>Contacts SAC-x*, BAC-x*, SBC-x, BBC-x, SCC-x, BCC-x</td>
</tr>
<tr>
<td></td>
<td>* Do not use for contacts SAC-2.50-xx, BAC-2.50-xx</td>
</tr>
</tbody>
</table>

| Tool frame M22520/1-01 and Turret M22520/1-02 (No fig.) | Crimp tool and turret from DMC or Buchanan. Order direct from OEM. |

**Note:** Crimp tool for crimping the socket contacts of the plug BAC-1,00-Ag and BAC-6,00-Ag
Assembly and installation dimensions

- **Cable receptacle ↔ plug, standard,**
  **Cable receptacle ↔ plug, short**

- **Cable receptacle ↔ flange plug**

- **Flange mount receptacle ↔ plug, standard,**
  **Flange mount receptacle ↔ plug, short**

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**Mounting holes**

- **Flange mount receptacle GA DF 1PL, Flange plug GA SF 1SC**

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**Dimensions in mm / Subject to change**

*Note:* Flange mount receptacle (GA DF 1PL) and flange plug (GA SF 1SC) are to be front-mounted. With plug (GA SF 1SC) please mind the extra hole for earthing.
Assembly instructions

- **Assembly of cable plug GA ST 1SC:**

- Slide thread cable gland (OEM part) 2a and backshell 2 on cable 1
- Crimp Grounding cable 1 to cable lug 10 and plug it on the earthing sleeve then slide it over cable 1
- Place O-ring 8 in coupling ring 9 and slide it on cable 1
- Slide O-ring 7 on contact insert 3
- Strip jacket of cable 1 to a length of approx. 30 mm and the insulation of the stranded wires to a length of 7 mm min.
- PE-strand (6 mm²) of cable 1 and earthing cable 11 (4 mm²) are both to be crimped in a socket contact (10 mm²)
- Use crimp tool CWZ-600-1 and crimp stripped wire ends to the control contacts 5 and power contacts 6
- Assemble the contact insert 3 with control contacts 5 and power contacts 6
- Slide backshell 2 over contact insert 3 and screw those.
- Screw thread cable gland 2a to backshell 2

- **Assembly of cable receptacle GA KD 1PL:**

- Slide thread cable gland (OEM part) 2a and backshell 2 on cable 1
- Strip jacket of cable 1 to a length of approx. 30 mm and the insulation of the stranded wires to a length of 11 mm and 6 mm min., respectively.
- Solder stripped wire ends to the terminal ends of the contact insert in the receptacle shell 3
- Screw receptacle shell with contact insert 3 into backshell 2
- Screw thread cable gland 2a to backshell 2

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Assembly of cable plug
- Slide thread cable gland (OEM part) 2a and backshell 2 on cable 1
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- Screw thread cable gland 2a to backshell 2
Electrical Components and Systems for Railway Engineering and Industrial Applications

Connectors
- Connectors manufactured to industry standards
- Connectors to suit the special requirements of communications engineering (MIL connectors)
- Charging connectors for battery-powered machines and systems
- Connectors for railway engineering, including UIC connectors
- Special connectors to suit customer requirements

Snap-action switches
- Snap-action switches with positive opening operation
- Snap-action switches with self-cleaning contacts
- Enabling switches
- Special switches to suit customer requirements

Contactors
- Single and multi-pole DC contactors
- High-voltage AC/DC contactors
- Contactors for battery-powered vehicles and power supplies
- Contactors for railway applications
- Terminal bolts and fuse holders
- DC emergency disconnect switches
- Special contactors to suit customer requirements

Electrics for rolling stock
- Equipment for driver’s cab
- Equipment for passenger use
- High-voltage switchgear
- High-voltage heaters
- High-voltage roof equipment
- Equipment for electric brakes
- Design and engineering of train electrics to customer requirements