Power & Signal Quality TRABTECH

PLUGTRAB PT-IQ

Intelligent and systematic surge protection
Surge protection for measurement and control technology

Signal interfaces are at far greater risk of surge voltages than power supply systems. This is a result of a) the numerous cables laid in parallel and b) the more sensitive input and output interfaces.

Based on the risk potential and safety level required for the interface, a variety of surge protective devices are used. These are installed directly before the signal inputs to be protected. The circuits of these protective devices are adapted to the relevant signal types.

**Hazards**

Unexpected device damage or system failures in data, measurement, and control technology are often caused by surge voltages. These occur as a result of lightning effects or switching operations in the power supply network. Time-consuming troubleshooting, replacements, repairs, and downtimes can result in considerable follow-up costs.

**Potential threats to industry**

In virtually all industries, a large number of signal lines are required in order to guarantee the smooth operation of system parts. If these signals drop out it can result in considerable costs.
Our solution: PLUGTRAB PT-IQ

The intelligent PLUGTRAB PT-IQ surge protection provides an effective method of limiting high-energy transients. This significantly increases the availability and operability of your systems and devices. As a plug-in and self-monitoring system, PLUGTRAB PT-IQ also offers additional advantages. Thanks to the multi-stage monitoring and signaling, you are aware of the status of the protective devices at all times. If a surge protective device is defective or reaches its performance limit as a result of a high-energy coupling, you can simply replace the damaged plug without having to interfere with the installation.

The advantages:
- Permanent and error-free installation
- Forward-looking monitoring
- Limitless extension
- Variable connection technology
- Installation directly in Ex zone 2
Intelligent and systematic surge protection

PLUGTRAB PT-IQ is a new, forward-looking surge protection system with a variety of new features. The intelligent monitoring of all voltage-limiting components immediately detects pre-existing damage as a result of high-energy surge voltages. The multi-stage signaling is carried out directly on site or via remote signaling.

A controller manages the installed protective devices. It supplies the system with voltage and also functions as the central evaluation unit for all status signals. As soon as each module is snapped on, the power supply and the status signal are connected. This considerably minimizes the amount of cabling required.

Forward-looking monitoring

PLUGTRAB PT-IQ provides multi-stage monitoring of the protective devices and issues group messages via the controller. A yellow status signal indicates that as a result of frequent surge voltages, the performance limit has been reached. The arresters continue to function and your system is still protected. A replacement is, however, recommended in order to avoid unnecessary service operations. Remote signaling enables you to check how well your system is being protected at any time and place.

Energy efficiency

The green LEDs on all protection modules can be switched off centrally via the controller.
Individual DIN rail connectors can be converted into a bus. This transmits the power supply and status information. Conventional wiring is not used.

**Vibration-resistant installation**

The new latching guarantees a secure fit for installations in harsh environments. It holds the plug in place in the base element, even during extremely strong vibrations.

**Error-free installation**

Voltage coding and protection against polarity reversal make incorrect connection impossible.

**Space-saving installation**

Up to five signal lines can be protected with one device. This requires a design width of just 17.5 mm on the DIN rail, meaning only 3.5 mm per signal line.

**Permanent installation**

Individual DIN rail connectors can be converted into a bus. This transmits the power supply and status information. Conventional wiring is not used.

**Limitless extension**

A controller supplies up to 28 protection modules with voltage via the DIN rail connectors. You can bridge these across DIN rails to supply additional protective devices. After 28 modules an additional controller must be installed in order to supply voltage.

**Variable connection technology**

Choose between the classic screw connection or push-in connection technology which is even faster to wire.
PLUGTRAB PT-IQ also with push-in connection technology

Push-in connection technology has proven extremely successful in terminal technology and is now also used in surge protective devices.

PT push-in connection terminal blocks have been developed for direct conductor connection. This means that solid or stranded conductors with ferrules can be directly inserted into the terminal block without tools. This further reduces the installation time required for PLUGTRAB PT-IQ.

Benefit from the further advantages of these technologies.

**Your advantages at a glance:**
- Fast and direct plugging of solid and stranded conductors with ferrules
- Reduced installation time
- Short operating paths – fast wiring times
- Conductor release without special tools
- No deformation of the contact chamber as a result of using incorrect tools
- Test connection at each terminal point (protected/unprotected)

**Easy insertion**
The reduction in insertion force of up to 50% offered by push-in technology enables easy, direct insertion of solid and stranded conductors with ferrules with a cross section of 0.34 mm² or higher.

**Latch function**
The integrated latch enables you to release connected conductors using any standard screwdriver – easily and without direct contact with the signal wires.

**All-round insulation**
The plastic latch protects the sensitive signals from contact with external potentials and prevents the contact chamber from being deformed as a result of using incorrect tools.
Surge protection for the Ex area

For the first time, the PLUGTRAB PT-IQ Ex protective devices have made it possible to install protective devices with multi-stage monitoring and remote signaling directly in Ex zone 2. The intrinsically safe protective circuits can be installed in areas up to Ex zone 0.

Your advantage: you can check the status of your protective devices directly on site or in the control room, even in intrinsically safe areas. You can replace the modules before a failure occurs.

Benefit from all the advantages of the surge protection system, even in the Ex area. You can monitor up to ten PT-IQ Ex surge protective devices via a central controller.

![Ex zone classification diagram]

- **Non-Ex area**: No explosive mixture present.
- **Zone 0**: An explosive mixture in the form of gas or vapor is **continuously, frequently or persistently** present.
- **Zone 1**: An explosive mixture in the form of gas or vapor is **sometimes** present.
- **Zone 2**: An explosive mixture in the form of gas or vapor is **rarely or temporarily** present.

No explosive mixture present.
Order overview: Surge protection products

The intelligent PLUGTRAB PT-IQ surge protection can be used in a variety of applications thanks to the different switching and voltage variants.

Depending on the application, you can choose between a direct and indirect ground connection. PLUGTRAB PT-IQ is available with push-in connection technology, which is quick to wire, or with the classic screw connection.

Regardless of the connection technology, the protective devices make contact when snapped on to the DIN rail in a way that is resistant to surge currents.

Protection for the Ex area
Suitable protective devices that can be installed in Ex zone 2 are also available for intrinsically safe signal circuits. The safe cables can of course be laid into Ex zone 0.

Indirect grounding
With the PT-IQ-...+F-... PT and PT-IQ-...+F-... UT protection modules, the connection terminal blocks for the shield or the reference potential are indirectly connected to the metal mounting foot and thereby the DIN rail via a gas-filled surge arrester.

Direct grounding
With the PT-IQ-...-PT and PT-IQ-...-UT protection modules, the connection terminal blocks for the shield or the reference potential are directly connected to the DIN rail via the metal mounting foot.
## Surge protection with push-in and screw connection technology

### Controller for power supply and remote signaling

<table>
<thead>
<tr>
<th>Push-in connection</th>
<th>Screw connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2801296 PT-IQ-PTB-PT</td>
<td>–</td>
</tr>
<tr>
<td>2800768 PT-IQ-PTB-UT</td>
<td>–</td>
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</tbody>
</table>

### Protection for two conductors

<table>
<thead>
<tr>
<th>Push-in connection</th>
<th>Screw connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect grounding</td>
<td>Direct grounding</td>
</tr>
<tr>
<td>2801244 PT-IQ-2X1+F-5DC-PT</td>
<td>2801243 PT-IQ-2X1-5DC-PT</td>
</tr>
<tr>
<td>2801246 PT-IQ-2X1+F-12DC-PT</td>
<td>2801245 PT-IQ-2X1-12DC-PT</td>
</tr>
<tr>
<td>2801248 PT-IQ-2X1+F-24DC-PT</td>
<td>2801247 PT-IQ-2X1-24DC-PT</td>
</tr>
<tr>
<td>2801250 PT-IQ-2X1+F-48DC-PT</td>
<td>2801249 PT-IQ-2X1-48DC-PT</td>
</tr>
<tr>
<td>2800779 PT-IQ-2X1+F-5DC-UT</td>
<td>2800778 PT-IQ-2X1-5DC-UT</td>
</tr>
<tr>
<td>2800781 PT-IQ-2X1+F-12DC-UT</td>
<td>2800780 PT-IQ-2X1-12DC-UT</td>
</tr>
<tr>
<td>2800788 PT-IQ-2X1+F-24DC-UT</td>
<td>2800787 PT-IQ-2X1-24DC-UT</td>
</tr>
<tr>
<td>2800790 PT-IQ-2X1+F-48DC-UT</td>
<td>2800789 PT-IQ-2X1-48DC-UT</td>
</tr>
</tbody>
</table>

### Protection for four conductors

<table>
<thead>
<tr>
<th>Push-in connection</th>
<th>Screw connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect grounding</td>
<td>Direct grounding</td>
</tr>
<tr>
<td>2801268 PT-IQ-4X1+F-5DC-PT</td>
<td>2801267 PT-IQ-4X1-5DC-PT</td>
</tr>
<tr>
<td>2801272 PT-IQ-4X1+F-24DC-PT</td>
<td>2801271 PT-IQ-4X1-24DC-PT</td>
</tr>
<tr>
<td>2801216 PT-IQ-4X1+F-5DC-UT</td>
<td>2801215 PT-IQ-4X1-5DC-UT</td>
</tr>
<tr>
<td>2800983 PT-IQ-4X1+F-24DC-UT</td>
<td>2800982 PT-IQ-4X1-24DC-UT</td>
</tr>
<tr>
<td>Protection for one double wire</td>
<td>Indirect grounding</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>2801252 PT-IQ-1X2+F-5DC-PT</td>
</tr>
<tr>
<td>Standard signals</td>
<td>2801254 PT-IQ-1X2+F-12DC-PT</td>
</tr>
<tr>
<td>0...10 V</td>
<td>2801256 PT-IQ-1X2+F-24DC-PT</td>
</tr>
<tr>
<td>0/4...20 mA</td>
<td>2801258 PT-IQ-1X2+F-48DC-PT</td>
</tr>
<tr>
<td>Push-in connection</td>
<td>2800792 PT-IQ-1X2+F-5DC-UT</td>
</tr>
<tr>
<td></td>
<td>2801264 PT-IQ-1X2+F-24DC-PT</td>
</tr>
<tr>
<td></td>
<td>2801266 PT-IQ-1X2+F-48DC-PT</td>
</tr>
<tr>
<td>Screw connection</td>
<td>2800809 PT-IQ-1X2+F-5DC-UT</td>
</tr>
<tr>
<td></td>
<td>2800977 PT-IQ-1X2+F-24DC-UT</td>
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<td></td>
<td>2800979 PT-IQ-1X2+F-48DC-UT</td>
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<table>
<thead>
<tr>
<th>Protection for two double wires</th>
<th>Indirect grounding</th>
<th>Direct grounding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2801260 PT-IQ-2X2+F-5DC-PT</td>
<td>2801259 PT-IQ-2X2-5DC-PT</td>
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<tr>
<td>Standard signals</td>
<td>2801264 PT-IQ-2X2+F-24DC-PT</td>
<td>2801263 PT-IQ-2X2-24DC-PT</td>
</tr>
<tr>
<td>0...10 V</td>
<td>2801266 PT-IQ-2X2+F-48DC-PT</td>
<td>2801265 PT-IQ-2X2-48DC-PT</td>
</tr>
<tr>
<td>0/4...20 mA</td>
<td>2800809 PT-IQ-2X2+F-5DC-UT</td>
<td>2800807 PT-IQ-2X2-5DC-UT</td>
</tr>
<tr>
<td>Push-in connection</td>
<td>2800981 PT-IQ-2X2+F-24DC-UT</td>
<td>2800980 PT-IQ-2X2-24DC-UT</td>
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<td>2800987 PT-IQ-2X2+F-48DC-UT</td>
<td>2800986 PT-IQ-2X2-48DC-UT</td>
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<tr>
<td>Screw connection</td>
<td>2800994 PT-IQ-2X2+F-5DC-UT</td>
<td>2800785 PT-IQ-2X2-5DC-UT</td>
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<table>
<thead>
<tr>
<th>Data technology</th>
<th>Indirect grounding</th>
<th>Direct grounding</th>
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<tbody>
<tr>
<td></td>
<td>2801287 PT-IQ-3-PB+F-PT</td>
<td>2801286 PT-IQ-3-PB-PT</td>
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<tr>
<td></td>
<td>2801289 PT-IQ-3-HF+F-12DC-PT</td>
<td>2801288 PT-IQ-3-HF-12DC-PT</td>
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<tr>
<td></td>
<td>2801292 PT-IQ-5-HF+F-5DC-PT</td>
<td>2801291 PT-IQ-5-HF-5DC-PT</td>
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<tr>
<td></td>
<td>2801295 PT-IQ-5-HF+F-12DC-PT</td>
<td>2801293 PT-IQ-5-HF-12DC-PT</td>
</tr>
<tr>
<td>Push-in connection</td>
<td>2800994 PT-IQ-3-PB+F-UT</td>
<td>2800785 PT-IQ-3-PB-UT</td>
</tr>
<tr>
<td></td>
<td>2800995 PT-IQ-3-HF+F-12DC-UT</td>
<td>2800786 PT-IQ-3-HF-12DC-UT</td>
</tr>
<tr>
<td>Screw connection</td>
<td>2800798 PT-IQ-5-HF+F-5DC-UT</td>
<td>2800797 PT-IQ-5-HF-5DC-UT</td>
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<tr>
<td></td>
<td>2800801 PT-IQ-5-HF+F-12DC-UT</td>
<td>2800799 PT-IQ-5-HF-12DC-UT</td>
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</tbody>
</table>
# Intelligent surge protection for the Ex area

## Controller for power supply and remote signaling

<table>
<thead>
<tr>
<th>Model</th>
<th>Indirect grounding</th>
<th>Direct grounding</th>
</tr>
</thead>
<tbody>
<tr>
<td>2800768 PT-IQ-PTB-UT</td>
<td>-</td>
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</tbody>
</table>

## Protection for one double wire

Standard signals
- 0...10 V
- 0/4...20 mA

<table>
<thead>
<tr>
<th>Model</th>
<th>Indirect grounding</th>
<th>Direct grounding</th>
</tr>
</thead>
<tbody>
<tr>
<td>2801512 PT-IQ-1X2-EX-24DC-UT</td>
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</tr>
</tbody>
</table>

## Protection for two double wires

Standard signals
- 0...10 V
- 0/4...20 mA

<table>
<thead>
<tr>
<th>Model</th>
<th>Indirect grounding</th>
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<tr>
<td>2801513 PT-IQ-2X2-EX-24DC-UT</td>
<td>-</td>
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</tr>
</tbody>
</table>

## Necessary accessories: partition plates

Partition plates for maintaining the minimum distance of 50 mm between the controller and Ex protection modules.

<table>
<thead>
<tr>
<th>Model</th>
<th>For flat DIN rails (7.5 mm)</th>
<th>For isolated DIN rails</th>
</tr>
</thead>
<tbody>
<tr>
<td>2905023 PT-IQ-EX-L-PP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2905024 PT-IQ-EX-H-PP</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Application examples with various connection technologies

Protection of one binary signal input and actuator circuit with PLUGTRAB PT-IQ, floating reference potential (negative pole).

Material:
1 x PT-IQ PTB-UT  
Order No. 2800989
n x PT-IQ 4x1+F-24DC-UT  
Order No. 2800983

Protection of one binary signal input and actuator circuit with PLUGTRAB PT-IQ, grounded reference potential (negative pole).

Material:
1 x PT-IQ PTB-PT  
Order No. 2801296
n x PT-IQ 4x1-24DC-PT  
Order No. 2801271
Protection of one analog measurement with PLUGTRAB PT-IQ.

Material:
2 x PT-IQ-PTB-UT
Order No. 2800989
2 x PT-IQ 1x2-24DC-UT
Order No. 2800976

Protection of one 6-wire measurement with PLUGTRAB PT-IQ.

Material:
1 x PT-IQ-PTB-UT
Order No. 2800989
2 x PT-IQ-4x1+F-24DC-UT
Order No. 2800983
2 x PT-IQ-2x1+F-24DC-UT
Order No. 2800788

Protection of one analog measurement in the intrinsically safe area with PLUGTRAB PT-IQ-Ex and SURGETRAB.

Material:
1 x PT-IQ-PTB-UT
Order No. 2800989
1 x PT-IQ-EX-L-PP
Order No. 2905023
1 x PT-IQ-1x2-EX-24DC-UT
Order No. 2801512
1 x S-PT-EX(I)-24DC
Order No. 2880671

Protection of data cables, e.g., an RS-485 interface with PLUGTRAB PT-IQ.

Material:
2 x PT-IQ-PTB-PT
Order No. 2801296
2 x PT-IQ-5-HF-12DC-PT
Order No. 2801293
Surge protection – perfectly equipped for remote monitoring

TRABTECH surge protective devices with remote indication contacts are ideal for integration into all remote indication concepts. Phoenix Contact offers solutions for this from a single source.

Wired transmission technologies

Controller → COM server → Permanent line modem → Permanent line modem

HMI → Controller

Controller → IO module

Everything from a single source
In addition to professional surge protection, Phoenix Contact also offers innovative solutions for the most diverse transmission technologies.
Wireless transmission technologies

Controller → Access point → Controller

GSM modem → Access point → GSM modem

High-performance controller → GPRS modem

Wireless modem → Access point → Wireless modem → Controller
Always up-to-date, always available to you. Here you’ll find everything on our products, solutions and service:

phoenixcontact.net

Product range

• Cables and connectors
• Controllers and PLCs
• DIN rail power supplies and UPS
• Electronic reversing contactors and motor control
• Electronics housing
• Ethernet networks
• Fieldbus components and systems
• Functional safety
• HMIs and industrial PCs

• I/O systems
• Industrial communication technology
• Industrial lighting
• Installation and mounting material
• Marking and labeling
• Measurement and control technology
• Modular terminal blocks
• Monitoring and signaling
• PCB terminal blocks and PCB connectors

• Plug-in connectors
• Protective devices
• Relays
• Sensor cables and connectors
• Software
• Surge protection devices
• System cabling for DCS and PLC
• Tools
• Wireless data communication