

# Precision Controls



Connectors

...perfectly switched!



Nass Controls LP

Nass Magnet GmbH

Precision Controls Kft.

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### The Enterprise

A group of successful companies:

Our group of companies is one of the largest European manufacturer of electromagnetic pilot valves suited for the following media:

air  
inert gases  
other media

as well as of magnetic systems for automotive applications, function fittings and connectors.

All over the world approximately 500 employees are engaged in the development, production and sale of our products. About 40 engineers in our development and construction departments will be glad to give you competent advice in questions of engineering-service, product optimization as well as rationalization. In case of any question, they will be available to help you with their know-how. The 80+ history of our company group represents equally continuity in the economical development and flexible adjustment to time and market. The fields of application of our products cover many different industrial branches, e.g.

industrial pneumatics  
food industry  
medical technology  
control technology  
process technology  
gas technology  
paper and printing technology  
petroleum industry  
environmental technology  
rail vehicles  
hydraulics

### The Companies

Nass Magnet GmbH, Hanover, Germany, is the headquarters of the company group. Over 200 employees work to develop and produce electromagnetic pilot valves suited for air, inert gases, and other media, as well as systems for the automotive industry.

Nass Controls LP, New Baltimore, Michigan, USA, is the distribution center for the North/South American and Australian markets. Here, the components produced by the company group are assembled and tested to create final products for the customer's specific application. In addition, other products and services combine to create a complete product range to satisfy the widely varied needs of the customers.

Precision Controls Kft., Veszprém, Hungary, employs approximately 250 knowledgeable individuals who work to develop and produce solenoid connectors, coils and function fitting products. They also produce a portion of the assemblies for the group as a whole.

Nass Magnet GmbH:

Klaus H. Kirchheim	President
Peter Morgenstern	Managing Director
Thomas Groetzinger	Managing Director

Nass Controls LP:

Klaus H. Kirchheim	President
R. Randall Bennett	Managing Director
Peter Morgenstern	Managing Director

Precision Controls Kft.:

Klaus H. Kirchheim	President
Peter Morgenstern	Managing Director
Dennis Müller	Managing Director

### Distribution Network

A list of our current trading partners can be found on our homepage [www.precisioncontrols.hu](http://www.precisioncontrols.hu).

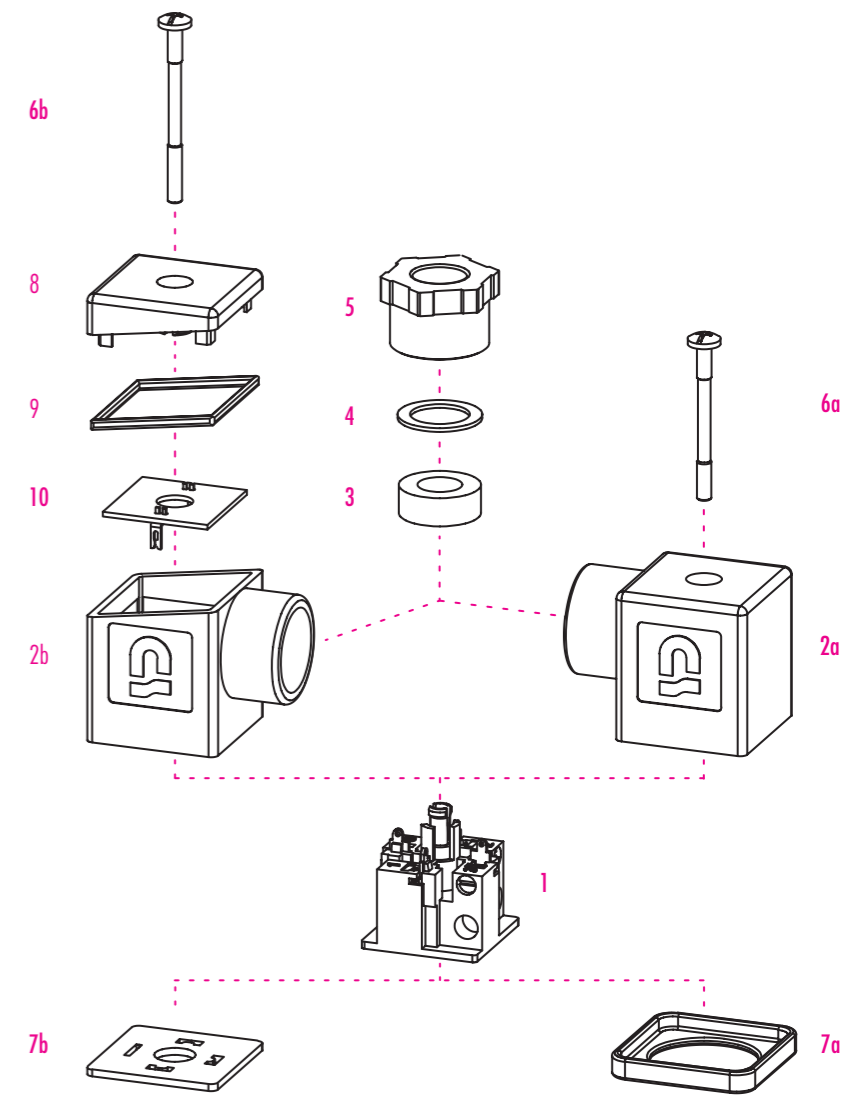
# Construction of Connectors without Cable

## Valve Connectors

Electrical connectors provide a fast and reliable interface for connection/disconnection to/from hydraulic and pneumatic valves, pressure switches, motor drives and other electrically driven industrial and mobil components. The product offering includes Form A, B and C, according to CECC/EN 175301-803. Innovative wire connecting methods and user-friendly assembly allow for easy installation to the electrical device. The connectors are available in many circuit versions to meet the customer's specific application requirements.



- 1 Terminal block with clamping contact (standard version)
- Two-piece housing
- 2b Housing
- 8 Cover
- 9 Cover gasket
- 2a One-piece housing
- 3 Grommet
- 4 Pressure ring
- 5 Pressure screw
- 6a/b Central-fixing screw
- 7a Profile gasket
- 7b Flat gasket
- 10 Circuit Board



## General Data

## Materials

## Colours

General Data	Form	Form A <sup>1)</sup>	Industrial Type B	Form B <sup>1)</sup>	Micro Type C	Form C <sup>1)</sup>
Operating voltage – versions without circuit		UC max. 250 V			UC max. 110 V	UC max. 250 V
Operating voltage – versions with circuit		See circuit versions, page 28 - 32				
Nominal current <sup>2)</sup>		10 A			6 A	
Contact resistance		≤4 mΩ				
Cable diameter		5-10 mm			5-6 mm	
Cross section of conductor with sleeve <sup>3)</sup>		0.5-1.5 mm <sup>2</sup> ; <sup>4)</sup>			0.34-0.5mm <sup>2</sup>	
Cross section of conductor without sleeve <sup>5)</sup>		0.5-1.5 mm <sup>2</sup>			0.34-0.5mm <sup>2</sup>	
Degree of protection acc. to DIN EN 60529		IP65				
Ambient temperature for versions with ...						
Housings in polyamide, black, grey, natural		-25 C°- 125 C°				
Housings in polyamide, transparent		-25 C°- 60 C°				
Housings with fire protection class V1 acc. to UL 94		-25 C°- 125 C°				
Housings for explosion-proof areas		-20 C°- 95 C°				
Profile gasket or flat gasket in NBR		-25 C°- 90 C°				
Profile gasket or flat gasket in silicone		-25 C°- 125 C°				
Tightening torque for ...						
Pressure screw		max. 1.8 ±0.2 Nm			max. 1.6 ±0.2 Nm	
Central-fixing screw		max. 0,4±0,1 Nm				
Contact screw		0.2+0,1 Nm				
Dimensions of central-fixing screw for ...						
One-piece housing		M 3x33.5				M 2.5x27
Two-piece housing		M 3x37.5				–

### Indications on Usage

- 1) Acc. to EN 175301-803
  - 2) Connectors with circuit in general 1.5 Va, except differently indicated, see page 28-32. Higher current versions upon request.
  - 3) We recommend to assemble the flying leads in our connectors with sleeves acc. to VDE 0100/520.
  - 4) The assembly of the 1.5 mm<sup>2</sup> flying leads with sleeve is only possible with our standard versions without wire protecting plate.
  - 5) We recommend our special version with wire protecting plate for the assembly of the flying leads without sleeve.
  - 6) LABS: Substances disturbing the wettability of varnish
- Explosion-proof areas:
- in gas explosive areas of zone 2. They comply with category II3C and the ignition protection type EEx nA II.
  - in areas of zone 22 with flammable dust. They comply with category II3D and degree of protection IP 65.

### Materials

Housing in polyamide, black, grey, natural; cover black, grey (for two-piece housings); terminal block for form A, Industrial Type B, form B	PA6 GF30
Housings in polyamide, transparent; transparent cover (for two-piece housings)	PA6-I
Housings black; terminal block with fire protection class V1 acc. to UL 94	PA6 GF30 V0-equipped
Housings transparent, with fire protection class V1 acc. to UL 94	Polycarbonate V0-equipped
Housings for explosion-proof areas	PA6 GF30 dry impact-resistant
Terminal block for Micro Type C, form C	PA6.6
Pressure screw	PA6 GF30
Contact	CuZn, Sn/Cu-plated
Central-fixing screw, contact screw	St, 4.8, zinc-plated
Pressure ring	St, zinc-plated
Grommet; gasket; cover gasket	NBR LABS-free <sup>6)</sup> or silicone

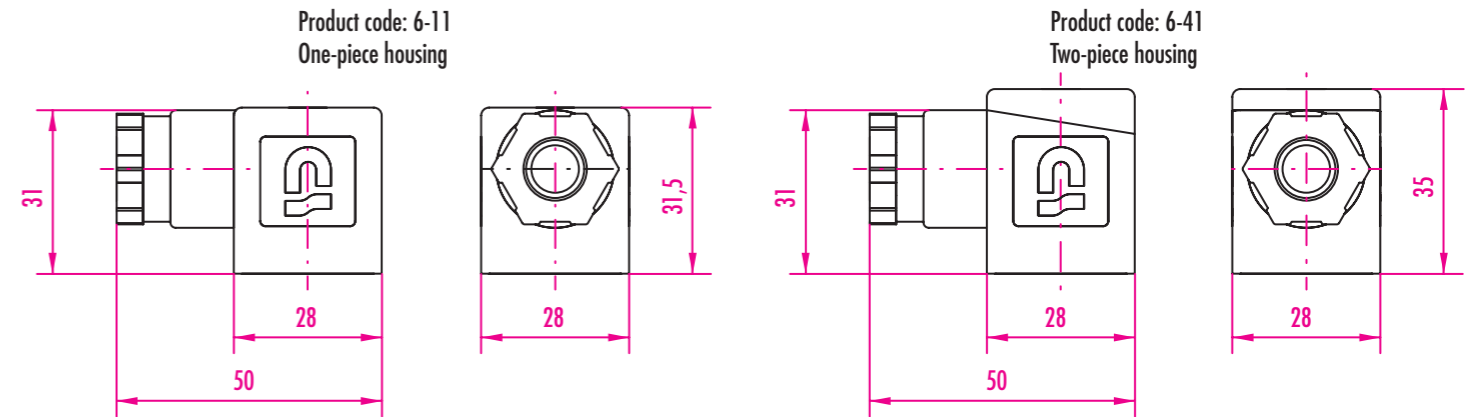
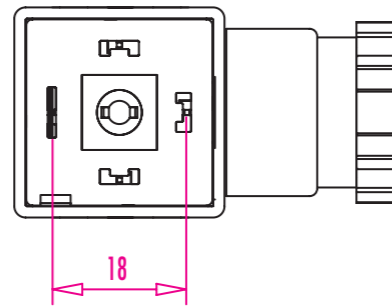
### Colours

RAL-code of the grey housing and the grey pressure screw	RAL 7040 "window grey"
Pressure screw for black and transparent housing	black
Pressure screw for grey housing	grey
Pressure screw for explosion-proof areas	black or blue
NBR gasket	black
Silicone gasket	red



## Form A acc. to EN 175301-803 (ISO 4400)

Product Code: 6-11, One-piece Housing  
Product Code: 6-41, Two-piece Housing



### Technical Data

Standard Product Features:	Special Versions as Options:
Clamping contact without wire protecting plate	Clamping contact with wire protecting plate
Housing with M 20x1.5 connection	Housing with M 16x1.5 connection
Housing and terminal block in polyamide	Housing with 1/2" NPTF connection
Colour of housing black	Housing and terminal block in plastic with fire protection class V1 acc. to UL94
Colour of housing grey	—
Colour of housing transparent	Colour of housing natural (milky)
Standard design of connectors	Design of connectors for explosion-proof areas
Cable gland without cable clamp	Cable gland with cable clamp
Ground position 12h	Ground position 3h, 6h, 9h
Central-fixing screw in St 4.8 zinc-plated	Central-fixing screw in stainless steel
PreCon logo in the housing	Customized logo on request
Packaging unit 100 pcs.	Single packaging

Additional special versions are available on request.  
Circuit versions see page 28 - 32

### Part Numbers of Standard Versions

6 - b 1 d e f - 2 h i k

Circuit version number  
00: without circuit; 01-99: see page 33; above 99 on request

Circuit version  
0= without circuit or components soldered directly to the contact  
5= components on the circuit board

Gasket and central-fixing screw  
0= without gasket and screw  
1= without gasket with standard screw  
2= NBR profile gasket, standard screw  
3= NBR flat gasket, standard screw  
4= silicone flat gasket, standard screw

Ground position and connection  
1= 6h, for cable 5-6mm  
2= 12h, for cable 5-6mm  
3= 6h, for cable 6-8mm  
4= 12h, for cable 6-8mm  
5= 6h, for cable 8-10mm  
6= 12h, for cable 8-10mm

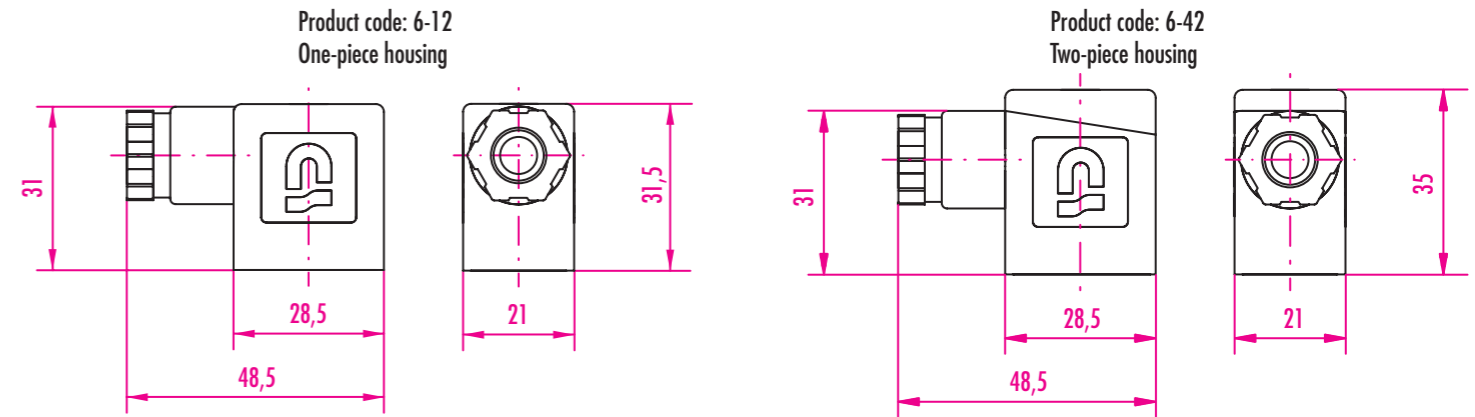
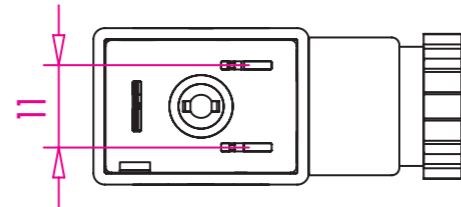
Number of poles and colour of housing  
1= 2+ground, black  
2= 2+ground, grey  
3= 2+ground, transparent without circuit or with circuit with components soldered directly to the contact  
4= 2+ground, transparent with circuit board  
5= 3+ground, black  
6= 3+ground, grey  
7= 3+ground, transparent without circuit or with circuit with components soldered directly to the contact  
8= 3+ground, transparent with circuit board

Housing version  
1= One-piece housing  
4= Two-piece housing



# Industrial Type B 11mm

Product Code: 6-12, One-piece Housing  
Product Code: 6-42, Two-piece Housing



### Technical Data

Standard Product Features:	Special Versions as Options:
Clamping contact without wire protecting plate	Clamping contact with wire protecting plate
Housing with M 16x1.5 connection	Housing with 1/2" NPTF connection
Housing and terminal block in polyamide	Housing and terminal block in plastic with fire protection class V1 acc. to UL94
Colour of housing black	—
Colour of housing grey	—
Colour of housing transparent	Colour of housing natural (milky)
Cable gland without cable clamp	Cable gland with cable clamp
Ground position 12h	Ground position 6h
Central-fixing screw in St 4.8 zinc-plated	Central-fixing screw in stainless steel
PreCon logo in the housing	Customized logo on request
Packaging unit 100 pcs.	Single packaging

Additional special versions are available on request.  
Circuit versions see page 28 - 32

### Part Numbers of Standard Versions

6 - b 2 d e f - 2 h i k

Circuit version number  
00: without circuit; 01-99: see page 33; above 99 on request

Circuit version  
0= without circuit or components soldered directly to the contact  
5= components on the circuit board

Gasket and central-fixing screw  
0= without gasket and screw  
1= without gasket with standard screw  
2= NBR profile gasket, standard screw  
3= NBR flat gasket, standard screw  
4= silicone flat gasket, standard screw

Ground position and connection  
1= 6h, for cable 5-6mm  
2= 12h, for cable 5-6mm  
3= 6h, for cable 6-8mm  
4= 12h, for cable 6-8mm  
5= 6h, for cable 8-10mm  
6= 12h, for cable 8-10mm

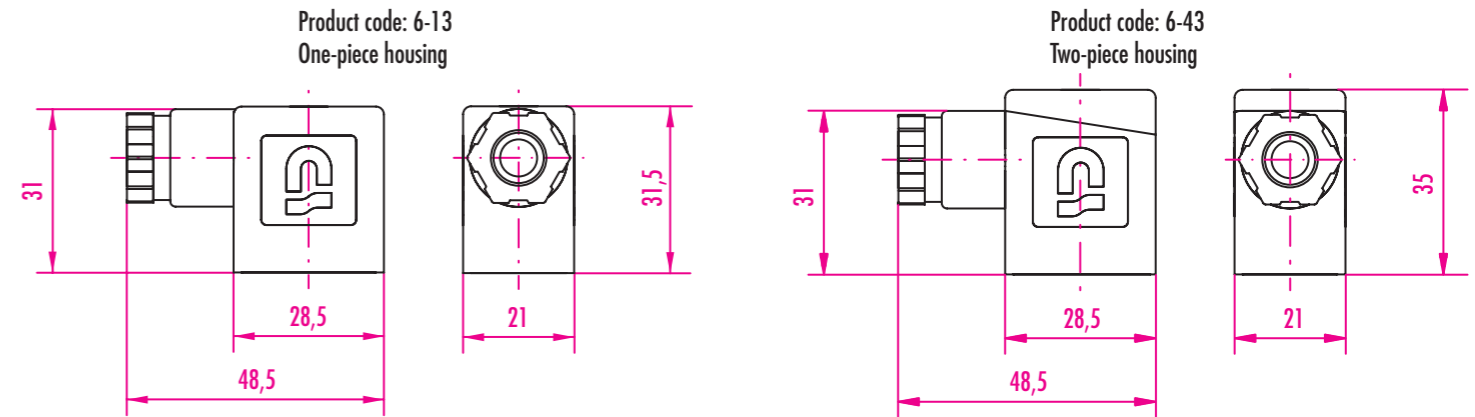
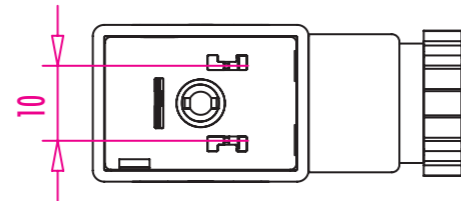
Number of poles and colour of housing  
1= 2+ground, black  
2= 2+ground, grey  
3= 2+ground, transparent without circuit or with circuit with components soldered directly to the contact  
4= 2+ground, transparent with circuit board

Housing version  
1= One-piece housing  
4= Two-piece housing



## Form B acc. to EN 175301-803 (ISO 6952)

Product Code: 6-13, One-piece Housing  
Product Code: 6-43, Two-piece Housing

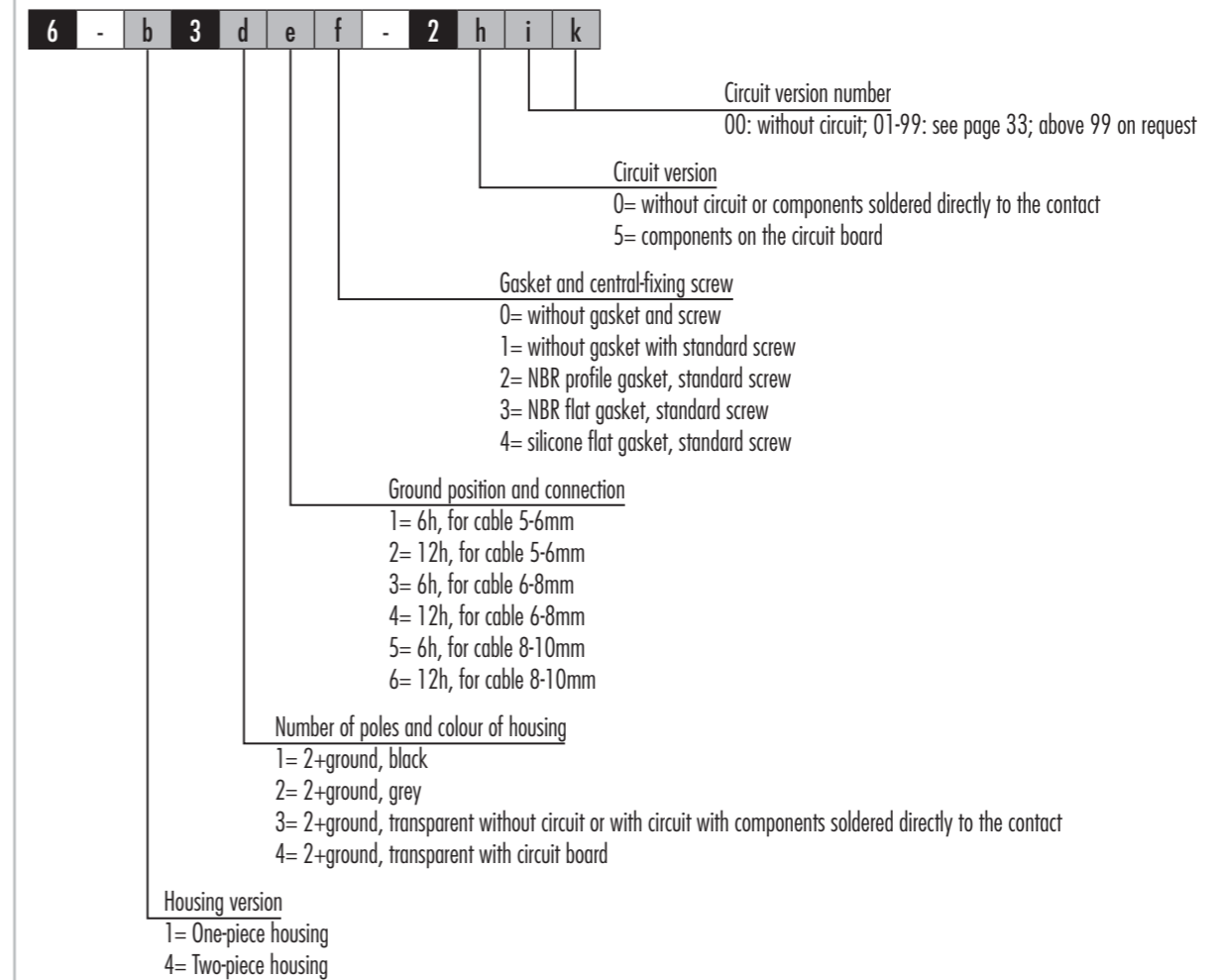


### Technical Data

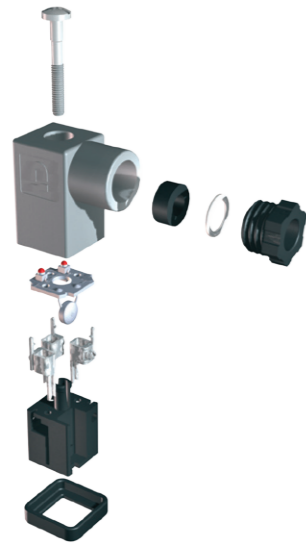
Standard Product Features:	Special Versions as Options:
Clamping contact without wire protecting plate	Clamping contact with wire protecting plate
Housing with M 16x1.5 connection	Housing with 1/2" NPTF connection
Housing and terminal block in polyamide	Housing and terminal block in plastic with fire protection class V1 acc. to UL94
Colour of housing black	—
Colour of housing grey	—
Colour of housing transparent	Colour of housing natural (milky)
Cable gland without cable clamp	Cable gland with cable clamp
Ground position 12h	Ground position 6h
Central-fixing screw in St 4.8 zinc-plated	Central-fixing screw in stainless steel
PreCon logo in the housing	Customized logo on request
Packaging unit 100 pcs.	Single packaging

Additional special versions are available on request.  
Circuit versions see page 28 - 32

### Part Numbers of Standard Versions

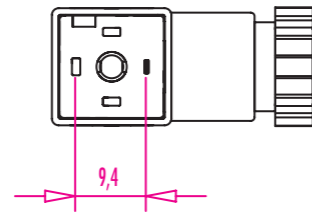




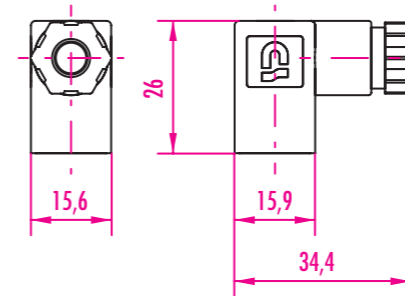


## Micro Type C (9.4 mm)

Product Code: 6-14, One-piece Housing



Product code: 6-14  
One-piece housing



### Technical Data

Standard Product Features:	Special Versions as Options:
Clamping contact without wire protecting plate	—
Housing with M 12 connection	—
Colour of housing black	—
Colour of housing grey	—
Colour of housing transparent	Colour of housing natural (milky)
Cable gland without cable clamp	—
Ground position 12h	Ground position 3h, 6h, 9h
Central-fixing screw in St 4.8 zinc-plated	Central-fixing screw in stainless steel
PreCon logo in the housing	Customized logo on request
Packaging unit 300 pcs.	Single packaging

Additional special versions are available on request.  
Circuit versions see page 28 - 32

### Part Numbers of Standard Versions

6 - 1 4 d e f - 0 h i k

Circuit version number  
00: without circuit; 01-99: see page 33; above 99 on request

Circuit version  
0= without circuit or components soldered directly to the contact  
5= components on the circuit board

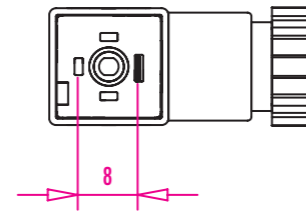
Gasket and central-fixing screw  
0= without gasket and screw  
1= without gasket with standard screw  
2= NBR profile gasket, standard screw  
3= NBR flat gasket, standard screw  
4= silicone flat gasket, standard screw

Ground position and connection  
1= 6h, for cable 5-6mm  
2= 12h, for cable 5-6mm

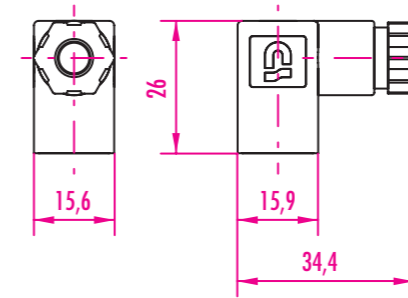
Number of poles and colour of housing  
1= 2+ground, black  
2= 2+ground, grey  
3= 2+ground, transparent without circuit or with circuit with components soldered directly to the contact  
4= 2+ground, transparent with circuit board  
5= 3+ground, black  
6= 3+ground, grey  
7= 3+ground, transparent without circuit or with circuit with components soldered directly to the contact  
8= 3+ground, transparent with circuit board

# Form C acc. to EN 175301-803 (ISO 15217) (8mm)

Product Code: 6-15, One-piece Housing



Product code: 6-15  
One-piece housing



### Technical Data

Standard Product Features:	Special Versions as Options:
Clamping contact without wire protecting plate	—
Housing with M 12 connection	—
Colour of housing black	—
Colour of housing grey	—
Colour of housing transparent	Colour of housing natural (milky)
Cable gland without cable clamp	—
Ground position 12h	Ground position 3h, 6h, 9h
Central-fixing screw in St 4.8 zinc-plated	Central-fixing screw in stainless steel
PreCon logo in the housing	Customized logo on request
Packaging unit 300 pcs.	Single packaging

Additional special versions are available on request.  
Circuit versions see page 28 - 32

### Part Numbers of Standard Versions

6 - 1 5 d e f - 2 h i k

Circuit version number  
00: without circuit; 01-99: see page 33; above 99 on request

Circuit version  
0= without circuit or components soldered directly to the contact  
5= components on the circuit board

Gasket and central-fixing screw  
0= without gasket and screw  
1= without gasket with standard screw  
2= NBR profile gasket, standard screw  
3= NBR flat gasket, standard screw  
4= silicone flat gasket, standard screw

Ground position and connection  
1= 6h, for cable 5-6mm  
2= 12h, for cable 5-6mm

Number of poles and colour of housing  
1= 2+ground, black  
2= 2+ground, grey  
3= 2+ground, transparent without circuit or with circuit with components soldered directly to the contact  
4= 2+ground, transparent with circuit board  
5= 3+ground, black  
6= 3+ground, grey  
7= 3+ground, transparent without circuit or with circuit with components soldered directly to the contact  
8= 3+ground, transparent with circuit board

## General Data

## Materials

## Colours

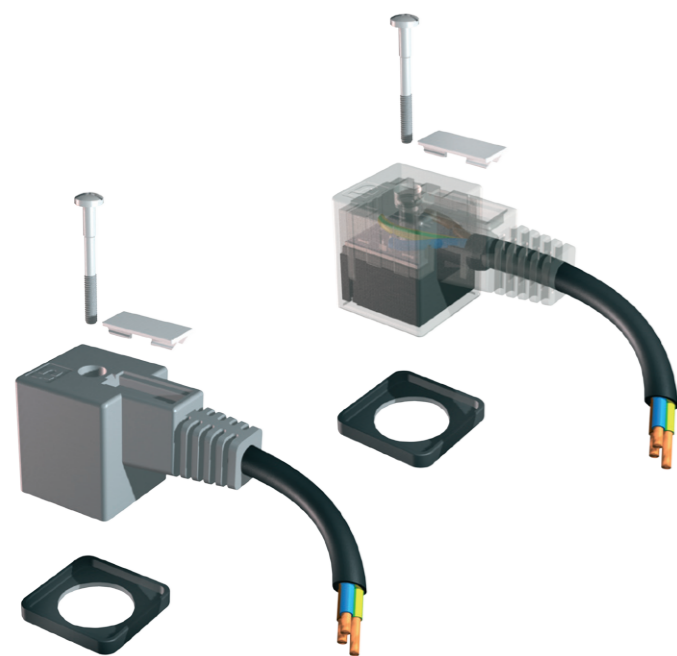
General Data	Form	Form A <sup>1)</sup>	Industrial Type B	Form B <sup>1)</sup>
Operating voltage – versions without circuit			UC max. 250V	
Operating voltage - versions with circuit			See circuit versions, page 28 - 32	
Nominal current <sup>2)</sup>			10A	
Contact resistance			≤ 4 mΩ	
Usable cable sizes to mould			3x0.75mm <sup>2</sup> , 4x0.75mm <sup>2</sup> , 3x1mm <sup>2</sup>	
Cross section of conductor			0,75-1.0mm <sup>2</sup>	
Degree of protection acc. to DIN EN 60529			IP 67	
Ambient temperature			-25°C - 70°C <sup>4)</sup>	
Tightening torque for central-fixing screw			max. 0.4 ±0.1Nm	
Dimension of central-fixing screw			M 3x33.5	

### Indications on Usage

- 1) Acc. to EN 175301-803
- 2) Connectors with circuit in general 1,5VA, expect differently indicated, see page 28-32. Higher current versions upon request.
- 3) LABS: Substances disturbing the wettability of varnish
- 4) Higher ambient temperatures are possible on request.

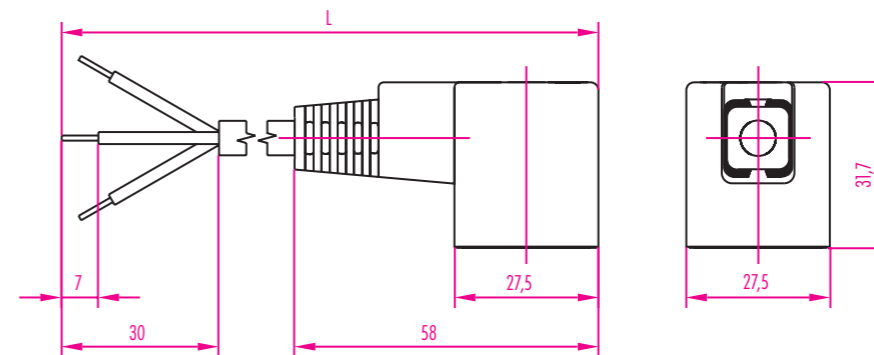
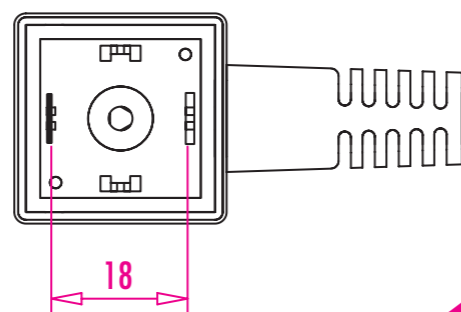
Materials	
Moulding	Soft PVC compound
Terminal block (component of the assembly to mould)	PA6 GF30
Cover (component of the assembly to mould)	PA6-I
Contact	CuZn, Sn/Cu-plated
Central-fixing screw	St 4.8 zinc-plated
Gasket	NBR LABS-free <sup>3)</sup> or silicone
Marking plate	PA6

Colours	
NBR gasket	black
Silicone gasket	red
Marking plate	white



## Form A acc. to EN 175301-803 (ISO 4400)

Product Code: 6-51  
With Moulded Cable



Product code: 6-51  
With moulded cable

### Technical Data

Standard Product Features:	Special Versions as Options:
Colour of moulding black for versions without LED Colour of moulding transparent for versions with LED	—
Cable length 2 m	Cable length 0 - 10 m, over 10 m on request
Cable type: H05VV-F3G0.75mm <sup>2</sup>	Heat- and/or oil resistant cable Other cable types on request
Colours of flying leads: 1=brown, 2=blue, ground=yellow/green	Depending on cable type
Version of loose cable end: flying leads with uninsulated sleeve	On request
Number of poles 2+1 ground, ground position 6h/12h	Number of poles 3+ground, ground position 12h or 6h
Central-fixing screw in St 4.8 zinc-plated	Central-fixing screw in stainless steel
PreCon logo in the moulding	Without logo
Marking plate	—
Packaging unit, depending on cable length up to 2m: 100 pcs. over 2m up to 8m: 50 pcs. over 8m up to 10m: 25 pcs.	—
Loose cable end	Cable end with moulded connector, different types Connecting cable: cable end with moulded M 12x1 connector acc. to IEC 60947-5-2

Additional special versions are available on request.  
Circuit versions see page 28 - 32

### Part Numbers of Standard Versions

6 - 5 1 0 2 f - 9 h i k

Standard cable length

1=cable length 1.0m

2=cable length 2.0m

3=cable length 3.0m

...

9=cable length 9.0m

0=cable length 10.0m

Circuit version number

00: without circuit; 01-99: see page 33; above 99 on request

Gasket and central-fixing screw

0= without gasket and screw

1= without gasket with standard screw

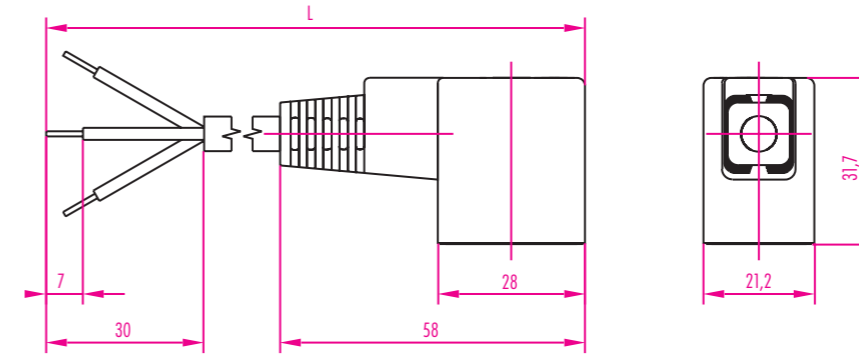
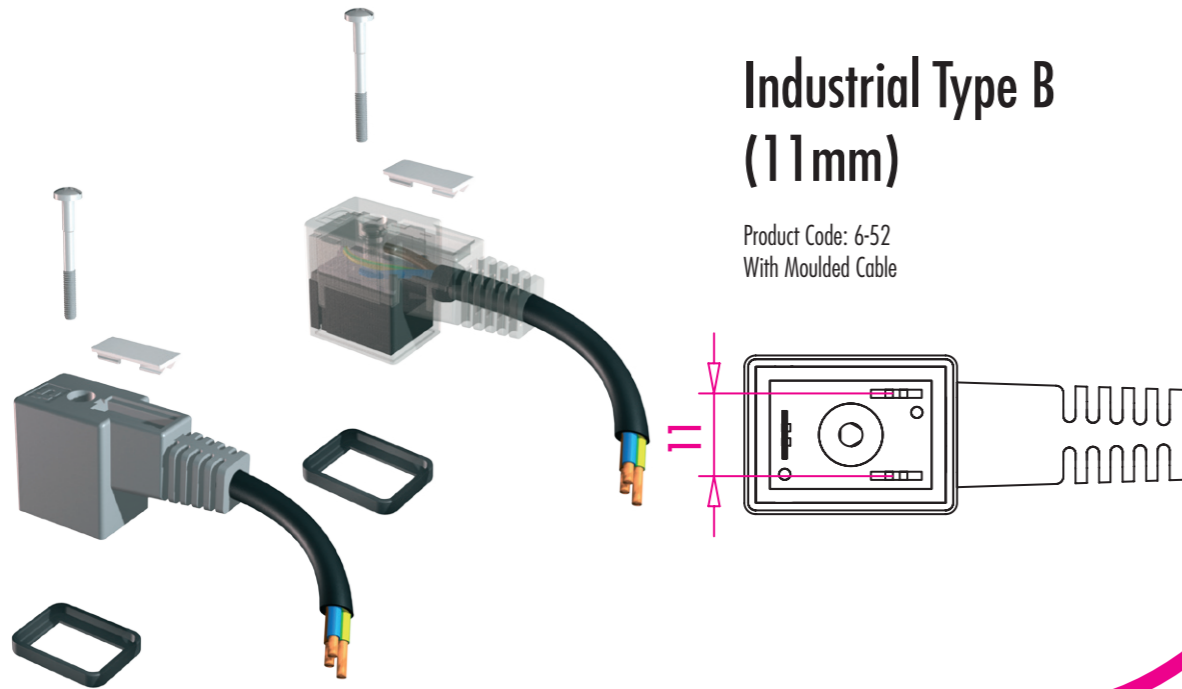
2= NBR profile gasket, standard screw

3= NBR flat gasket, standard screw

4= silicone flat gasket, standard screw

# Industrial Type B (11mm)

Product Code: 6-52  
With Moulded Cable



Product code: 6-52  
With moulded cable

Technical Data	
Standard Product Features:	Special Versions as Options:
Colour of moulding black for versions without LED Colour of moulding transparent for versions with LED	—
Cable length 2 m	Cable length 0 - 10 m, over 10 m on request
Cable type: H05VV-F3G0.75mm <sup>2</sup>	Heat- and/or oil resistant cable Other cable types on request
Colours of flying leads: 1=brown, 2=blue, ground=yellow/green	Depending on cable type
Version of loose cable end: flying leads with uninsulated sleeve	On request
Ground position 12h	Ground position 6h
Central-fixing screw in St 4.8 zinc-plated	Central-fixing screw in stainless steel
PreCon logo in the moulding	Without logo
Marking plate	—
Packaging unit, depending on cable length up to 2m: 100 pcs. over 2m up to 8m: 50 pcs. over 8m up to 10m: 25 pcs.	—
Loose cable end	Cable end with moulded connector, different types Connecting cable: cable end with moulded M 12x1 connector acc. to IEC 60947-5-2

Additional special versions are available on request.  
Circuit versions see page 28 - 32

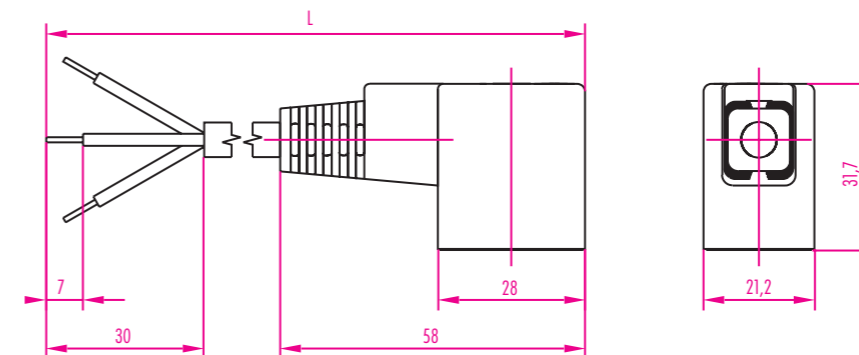
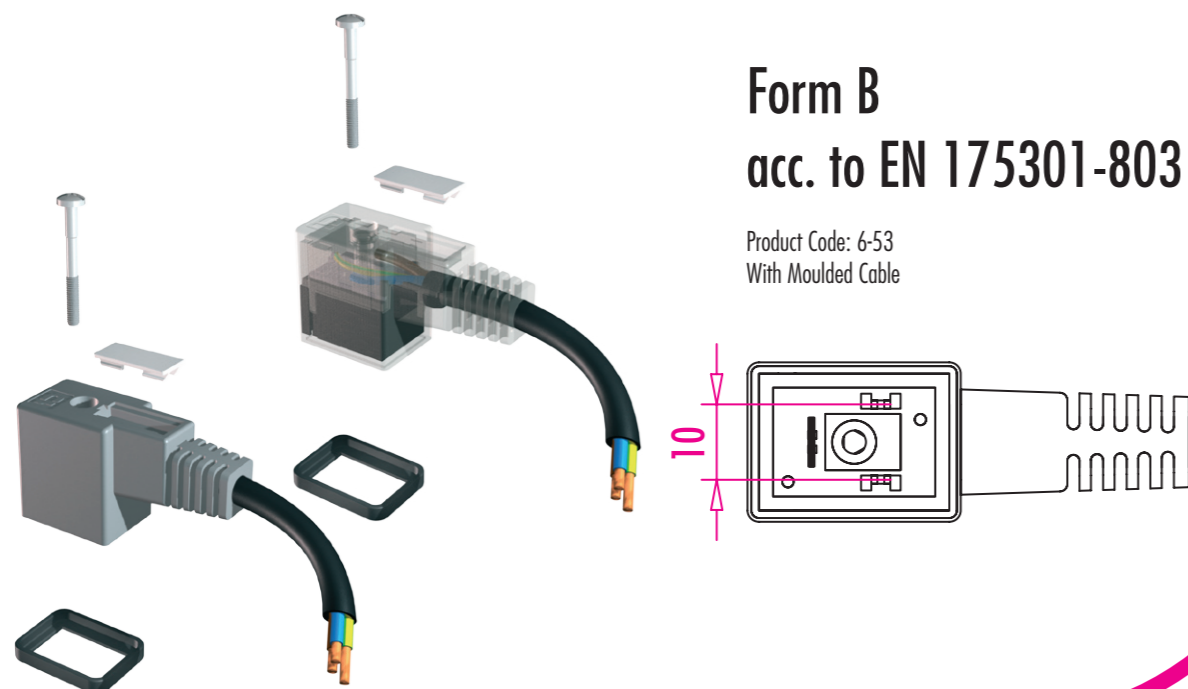
### Part Numbers of Standard Versions

6 - 5 2 d 2 f - 9 h i k

- Standard cable length
  - 1=Cable length 1.0m
  - 2=Cable length 2.0m
  - 3=Cable length 3.0m
  - ...
  - 9=Cable length 9.0m
  - 0=Cable length 10.0m
- Circuit version number
  - 00: without circuit; 01-99: see page 33; above 99 on request
- Gasket and central-fixing screw
  - 0= without gasket and screw
  - 1= without gasket with standard screw
  - 2= NBR profile gasket, standard screw
  - 3= NBR flat gasket, standard screw
  - 4= silicone flat gasket, standard screw
- Ground position and number of poles
  - 1=6h, 2+ground
  - 2=12h, 2+ground

## Form B acc. to EN 175301-803 (ISO 6952)

Product Code: 6-53  
With Moulded Cable



Product code: 6-53  
With moulded cable

### Technical Data

Standard Product Features:	Special Versions as Options:
Colour of moulding black for versions without LED Colour of moulding transparent for versions with LED	—
Cable length 2 m	Cable length 0 - 10 m, over 10 m on request
Cable type: H05VV-F3G0.75mm <sup>2</sup>	Heat- and/or oil resistant cable Other cable types on request
Colours of flying leads: 1=brown, 2=blue, ground=yellow/green	Depending on cable type
Version of loose cable end: flying leads with uninsulated sleeve	On request
Ground position 12h	Ground position 6h
Central-fixing screw in St 4.8 zinc-plated	Central-fixing screw in stainless steel
PreCon logo in the moulding	Without logo
Marking plate	—
Packaging unit, depending on cable length up to 2m: 100 pcs. over 2m up to 8m: 50 pcs. over 8m up to 10m: 25 pcs.	—
Loose cable end	Cable end with moulded connector, different types Connecting cable: cable end with moulded M 12x1 connector acc. to IEC 60947-5-2

Additional special versions are possible on request!  
Circuit versions see page 28 - 32

### Part Numbers of Standard Versions

6 - 5 3 d 2 f - 9 h i k

Standard cable length

1=Cable length 1.0m

2=Cable length 2.0m

3=Cable length 3.0m

...

9=Cable length 9.0m

0=Cable length 10.0m

Circuit version number

00: without circuit; 01-99: see page 33; above 99 on request

Gasket and central-fixing screw

0= without gasket and screw

1= without gasket with standard screw

2= NBR profile gasket, standard screw

3= NBR flat gasket, standard screw

4= silicone flat gasket, standard screw

Ground position and number of poles

1=6h, 2+ground

2=12h, 2+ground

# Circuit versions 01-06

Applicable for Product Code(s)												
Circuit Diagram	Description		6-11 6-41	6-51	6-12 6-42	6-52	6-13 6-43	6-53	6-14	6-15		
	Circuit 01 bipolar LED	AC DC	12V	X	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	X	
			48V	X	X	X	X	X	X	X	X	X
			120V	X	X	X	X	X	X	X	X	X
			230V	X	X	X	X	X	X	X	X	X
	Circuit 02 bipolar LED and protective diode drop-off delay app. 30ms	DC	12V	X	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	X	
			48V	X	X	X	X	X	X	X	X	X
			120V									
			230V									
	Circuit 03 bipolar LED and varistor drop-off delay app. 3ms (The energy in the coil is restricted by the varistor.)	AC DC	12V	X	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	X	
			48V	X	X	X	X	X	X	X	X	X
			120V	X	X	X	X	X	X	X	X	X
			230V	X	X	X	X	X	X	X	X	X
	Circuit 04 diode drop-off delay app. 30ms	DC	12V	X	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	X	
			48V	X	X	X	X	X	X	X	X	X
			120V									
			230V									
	Circuit 05 varistor drop-off delay app. 3ms (The energy in the coil is restricted by the varistor.)	AC DC	12V	X	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	X	
			48V	X	X	X	X	X	X	X	X	X
			120V	X	X	X	X	X	X	X	X	X
			230V	X	X	X	X	X	X	X	X	X
	Circuit 06 double Z-diode drop-off delay app. 3ms	AC DC	12V									
			24V	X	X	X	X	X	X			
			48V									
			120V									
			230V									

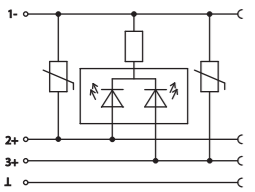
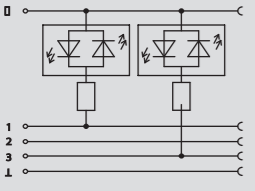
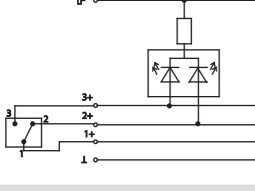
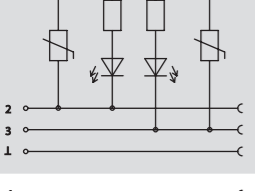
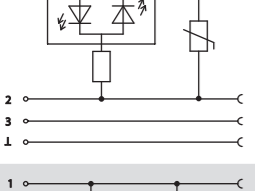
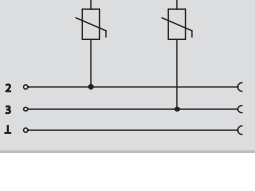
# Circuit Versions 07-12

Applicable for Product Code(s)											
Circuit Diagram	Description		6-11 6-41	6-51	6-12 6-42	6-52	6-13 6-43	6-53	6-14	6-15	
	Circuit 07 bipolar LED and double Z-diode drop-off delay app. 3ms	AC DC	12V								
			24V	X	X	X	X	X	X		
			48V								
			120V								
			230V								
	Circuit 08 bridge rectifier and varistor drop-off delay app. 3ms operating current max. 1.5 A <sup>1)</sup>	AC	12V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
			24V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
			48V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
			120V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
			230V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
	Circuit 09 bridge rectifier with varistor and bipolar LED drop-off delay app. 3ms operating current max. 1.5 A <sup>1)</sup>	AC DC	12V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
			24V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
			48V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
			120V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
			230V	0 <sup>2)</sup>	X	0 <sup>2)</sup>		0 <sup>2)</sup>			
	Circuit 10 12-48V AC/DC lamp 120-230 V AC glow lamp	AC DC	12V	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	X
			48V	X	X	X	X	X	X	X	X
			120V	X	X	X	X	X	X	X	X
			230V	X	X	X	X	X	X	X	X
	Circuit 11 12-48V AC/DC lamp with varistor 120-230 V AC glow lamp with varistor drop-off delay app. 3ms (The energy in the coil is restricted by the varistor.)	AC DC	12V	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	X
			48V	X	X	X	X	X	X	X	X
			120V	X	X	X	X	X	X	X	X
			230V	X	X	X	X	X	X	X	X
	Circuit 12 lamp with protective diode drop-off delay app. 30ms	DC	12V	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	
			48V	X	X	X	X	X	X	X	X
			120V								
			230V								

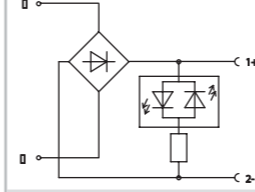
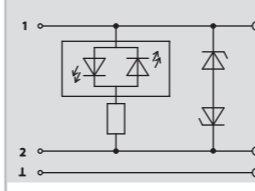
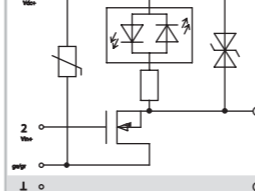
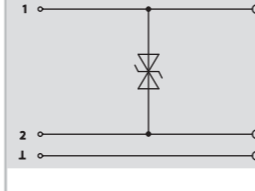
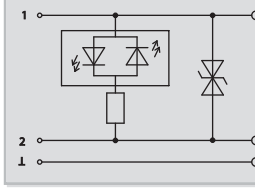
<sup>1)</sup> A circuit version with an operating current of 3A is also available for products 6-48.

<sup>2)</sup> Only for connectors with two-piece housing.

# Circuit Versions 13-18

Applicable for Product Code(s)				6-11 6-41	6-51	6-12 6-42	6-52	6-13 6-43	6-53	6-14	6-15	
	Circuit 13 2 coloured LED and 2 varistors drop-off delay app. 3ms (The energy in the coil is restricted by the varistor.)	AC DC	12V	X								
			24V	X								
			48V	X								
			120V	X								
			230V	X								
	Circuit 14 2 bipolar LED	AC DC	12V	X								
			24V	X								
			48V	X								
			120V	X								
			230V	X								
	Circuit 15 2 coloured LED for pressure switch	AC DC	12V	X								
			24V	X								
			48V	X								
			120V	X								
			230V	X								
	Circuit 16 2 bipolar LED and 2 varistors drop-off delay app. 3ms (The energy in the coil is restricted by the varistor.)	AC DC	12V	X								
			24V	X								
			48V	X								
			120V	X								
			230V	X								
	Circuit 17 connector 3+G with bipolar LED and varistor between contact 1-2 (The energy in the coil is restricted by the varistor.)	AC DC	12V	X								
			24V	X								
			48V	X								
			120V	X								
			230V	X								
	Circuit 18 2 varistors drop-off delay app. 3ms (The energy in the coil is restricted by the varistor.)	AC DC	12V	X								
			24V	X								
			48V	X								
			120V	X								
			230V	X								

# Circuit Versions 19-27

Applicable for Product Code(s)				6-11 6-41	6-51	6-12 6-42	6-52	6-13 6-43	6-53	6-14	6-15	
	Circuit 19 bridge rectifier with bipolar LED drop-off delay app. 3ms operating current max. 1.5 A <sup>1)</sup>	AC DC	12V	X								
			24V	X								
			48V	X								
			120V	X								
			230V	X								
	Circuit 20 bipolar LED with 2 Z-diodes drop-off delay app. 3ms	AC DC	12V									
			24V	X								
			48V									
			120V									
			230V									
	Circuit 23 signal amplifier (N-channel) drop-off delay app. 30ms	AC DC	12V									
			24V	X	X							
			48V									
			120V									
			230V									
	Circuit 25 TVS diode drop-off delay app. 3ms	AC DC	12V	X	X	X	X	X	X	X	X	
			24V	X	X	X	X	X	X	X	X	X
			48V	X	X	X	X	X	X	X	X	X
			120V	X	X	X	X	X	X	X	X	X
			230V	X	X	X	X	X	X	X	X	X
On request	Circuit 26 power reducer	DC	12V									
			24V	X								
			48V									
			120V									
			230V									
	Circuit 27 bipolar LED with TVS diode drop-off delay app. 3ms	AC DC	12V	X								
			24V	X								
			48V	X								
			120V	X								
			230V	X								

<sup>1)</sup>A circuit version with an operating current of 3A is also available for products 6-41.



# Circuit Versions 28-29

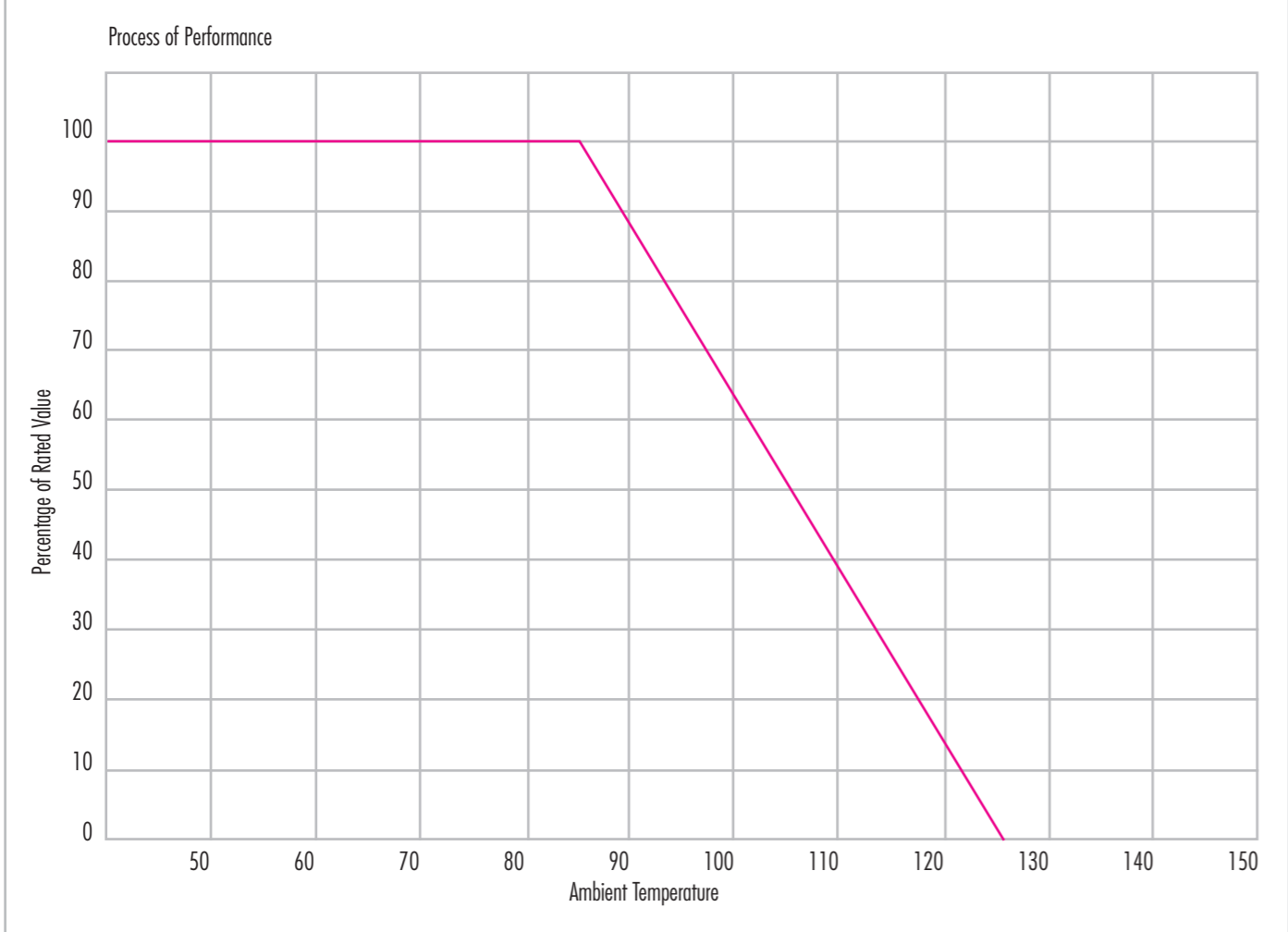
Applicable for Product Code(s)											
Circuit Diagram	Description		6-11 6-41	6-51	6-12 6-42	6-52	6-13 6-43	6-53	6-14	6-15	
	Circuit 28 signal amplifier (P-channel) inverter drop-off delay app. 30ms	DC	12V								
		24V	X								
		48V									
		120V									
		230V									
	Circuit 29 signal amplifier (P-channel) drop-off delay app. 30ms	DC	12V								
		24V	X								
		48V									
		120V									
		230V									

Circuit Version No.	Without LED					Colour of LED: red					Colour of LED: yellow					Colour of LED: green				
	12V	24V	48V	110V	230V	12V	24V	48V	110V	230V	12V	24V	48V	110V	230V	12V	24V	48V	110V	230V
Circuit 01 Bipolar LED	-	-	-	-	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Circuit 02 Bipolar LED and protective diode	-	-	-	-	-	aA	16	aA	aA	aA	aA	17	aA	aA	aA	aA	18	aA	aA	aA
Circuit 03 Bipolar LED and varistor	-	-	-	-	-	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Circuit 04 Diode	34	34	34	34	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circuit 05 Varistor	35	36	37	38	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circuit 06 Double Z-diode	40	41	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circuit 07 Bipolar LED and double Z-diode	-	-	-	-	-	43	44	45	-	-	46	47	48	-	-	49	50	51	-	-
Circuit 08 Bridge rectifier and varistor	52	53	54	55	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circuit 09 Bridge rectifier and varistor with bipolar LED	-	-	-	-	-	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
Circuit 10 Lamp, glow lamp	72	73	74	75	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circuit 11 Lamp, glow lamp with varistor	77	78	79	80	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circuit 12 Lamp with protective diode	aA	82	aA	aA	aA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circuit 17 Bipolar LED and varistor for 3+ground	-	-	-	-	-	aA	aA	99	aA	aA	aA	aA	aA	aA	aA	aA	aA	aA	aA	aA

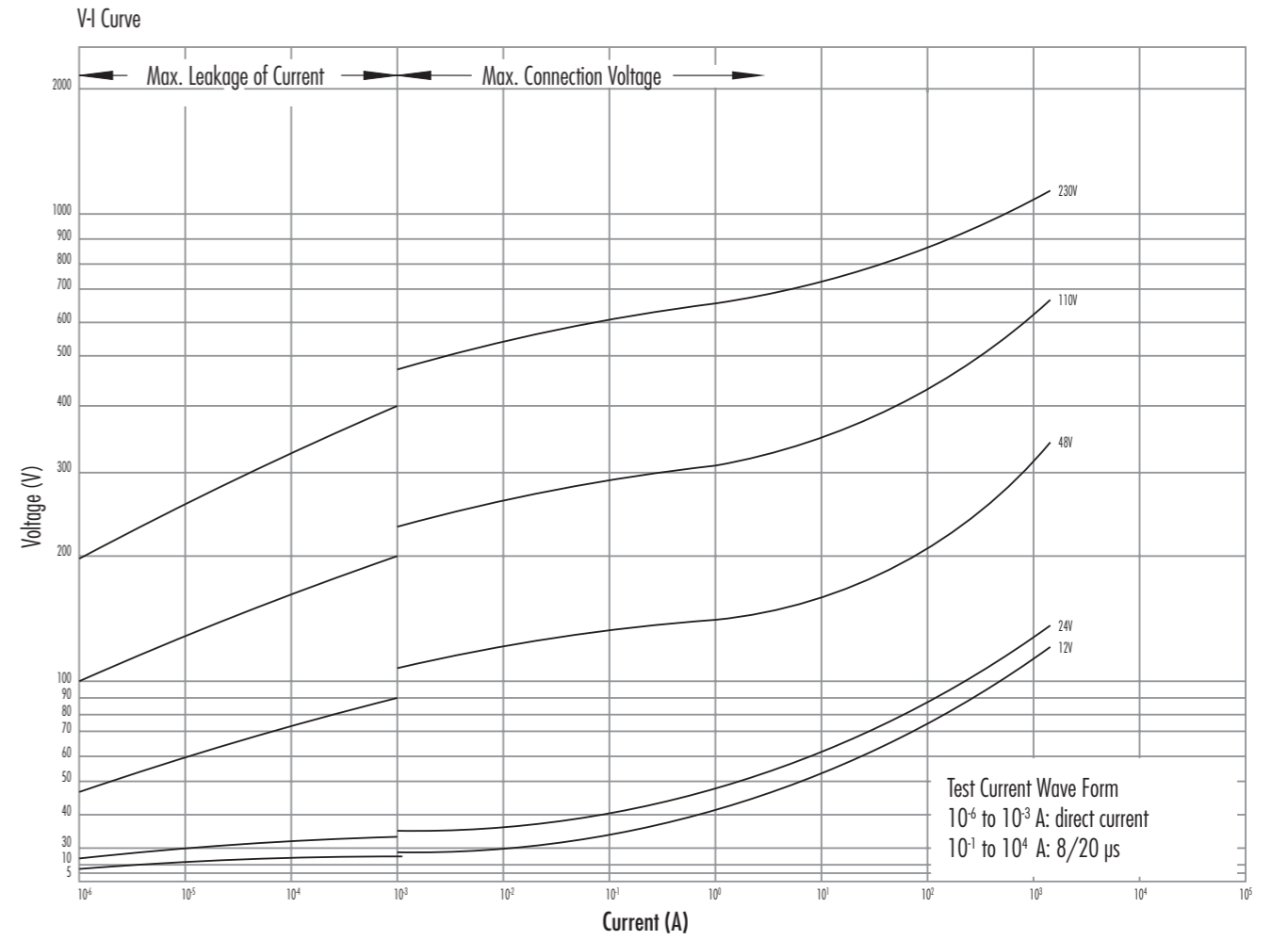
Circuit Version No.	Colour of LED: red-green					Colour of LED: yellow-green				
	12V	24V	48V	110V	230V	12V	24V	48V	110V	230V
Circuit 13 2 coloured LED and 2 varistors	aA	91	aA	92	93	aA	94	aA	95	96
Circuit 14 2 bipolar LED	aA	83	aA	aA	aA	aA	84	aA	aA	aA
Circuit 15 2 coloured LED for pressure switch	aA	85	aA	86	87	aA	88	aA	89	90
Circuit 16 2 bipolar LED and 2 varistors	aA	aA	97	aA	98	aA	aA	aA	aA	aA

-- not available      aA = on request

Derating Curve



Varistor Data



Varistor	Max. Voltage		Varistor Voltage (1mA)			Clamping Voltage (8/20 s)		Max. Energy 10/1000 s	Peak of Current (8/20 s) A	Rated Power W	Capacitance (1kHz) pf
	V-AC	V-DC	Min.	Nom.	Max.	Vc (V)	I <sub>p</sub> (A)				
12/5	14	18	18.7	22	26	51	1	0.50	100	0.01	1500
12/7	14	18	18.7	22	26	47	2.5	1.10	250	0.02	3600
24/5	30	38	42	47	55	104	1	1.10	100	0.01	650
24/7	30	38	42	47	52	93	2.5	2.50	250	0.02	1550
48/5	60	85	90	100	110	175	5	3.00	400	0.10	290
48/7	60	85	90	100	110	165	10	6.50	1200	0.25	750
110/5	140	180	198	220	242	380	5	7.00	400	0.10	110
110/7	140	180	198	220	242	360	10	14.00	1200	0.25	250
230/5	275	350	387	430	473	745	5	13.00	400	0.10	70
230/7	275	350	387	430	473	710	10	28.00	1200	0.25	150

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