Benefits of WAGO Connection Technology

Gastight Clamping Units – Measurable Contact Quality



Climatic chambers simulate standard atmospheres that could impact long-term constancy of clamping units. All WAGO products meet requirements for the following climatic tests:

- Temperature Cycling Test to IEC/EN 60947-7-1, IEC/EN 60998-2-2
- Industrial Atmospheres to EN ISO 6988, IEC/EN 60068-2-42, IEC/EN 60068-2-60
- Salt Spray Test to IEC/EN 60068-2-11, Marine Applications GL, LR, DNV
- Quick Change of Temperature to IEC/EN 60068-2-14
- Damp Heat, Cyclic (12 + 12 Hours) to IEC/EN 60068-2-30, Marine Applications GL, LR, DNV

Long-term consistency for the low contact resistance of both CAGE CLAMP® and CAGE CLAMP®S results from **gas-tight** clamping units. The spring clamp (acid- and saltwater-proof CrNi spring steel) presses the connected conductor against the current bar (electrolyte copper with lead-free, pure tin coating) within a defined contact zone. The conductor is embedded into the soft tin layer with high contact pressure, securing it against corrosive infiltration.

The contact pressure

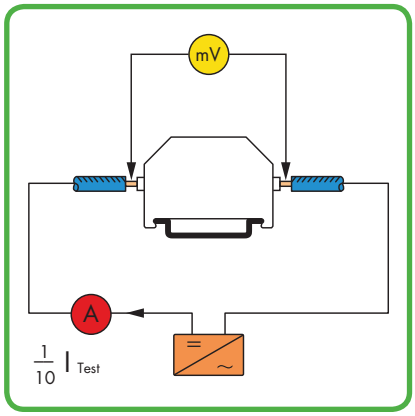
$$P\left[\frac{N}{mm^2}\right] = \frac{\text{Force F [N]}}{\text{Area A [mm}^2\text{]}}$$

exerted by CAGE CLAMP® terminations is similar to screw-style terminals.



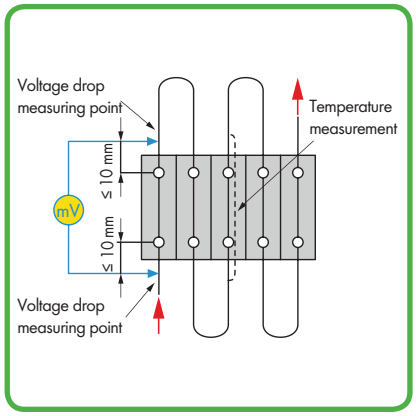
To best evaluate the quality of a clamping point, WAGO uses the following test procedures:

The **Voltage Drop Test** evaluates clamping unit quality under stresses such as vibrations, temperature changes and corrosive influences.



Test arrangement: "Voltage Drop Test"

The **Temperature-Rise Test** examines the clamping unit, including the surrounding insulation, at rated current, overcurrent and short-circuit current levels.



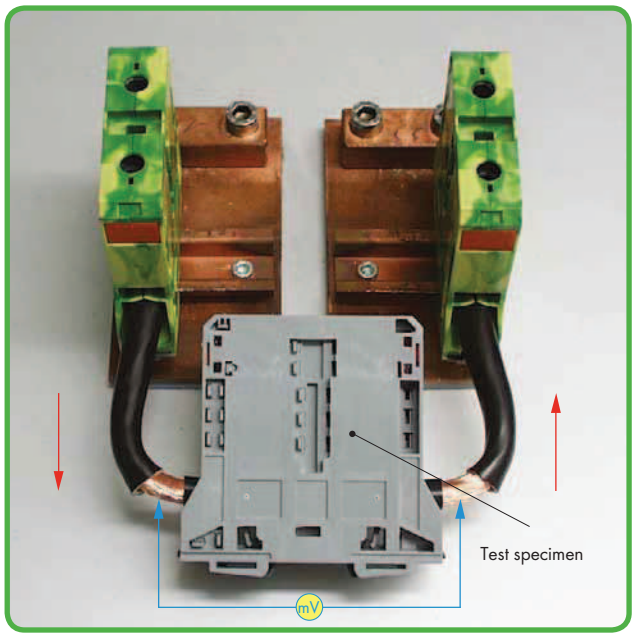
Test arrangement: "Temperature-Rise Test"

High-Current Carrying Capacity

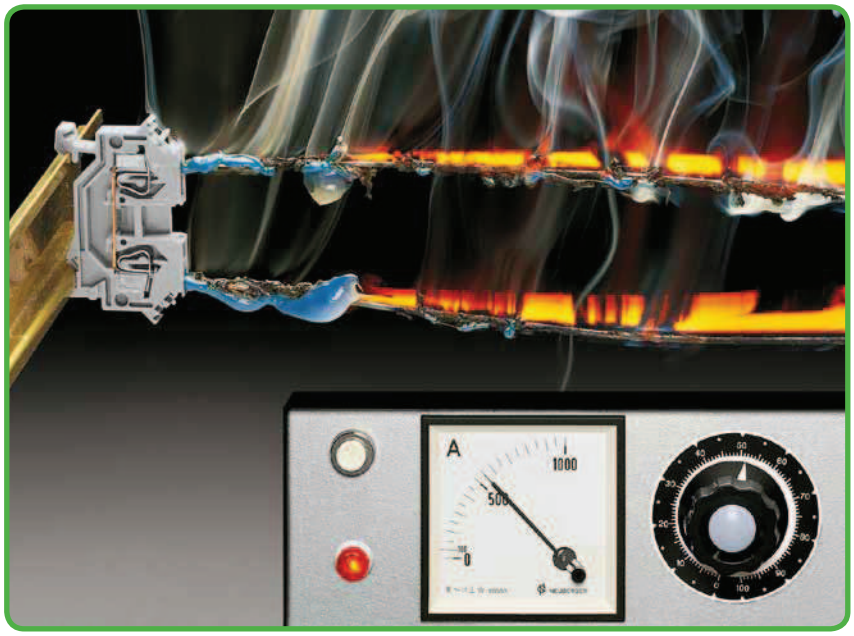
The **short-time withstand capacity** is defined in standards such as IEC/EN 60947-7-1 for through rail-mounted terminal blocks. It is a **current-carrying capacity of 120A per mm² nominal diameter** for the duration of 1 second. **In the case of a 4/0 AWG (95 mm²)** WAGO 285 Series **High-Current Terminal Block, this translates to 11,400A!**

Ground conductor terminal blocks are submitted to the "120A per mm²" test for 3x one second.

The pass criterion for the test is the voltage drop (limit value and constancy). CAGE CLAMP® and CAGE CLAMP®S connections passed this test without damage or reduced functionality.



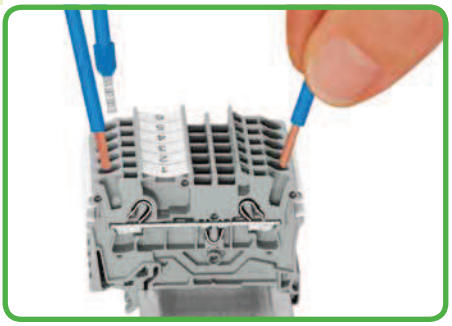
Test arrangement: "Short-Time Current Withstand Test"



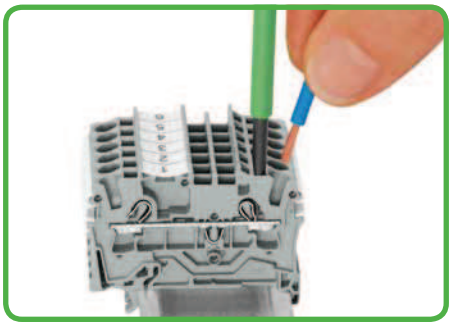
Unrealistic test of a CAGE CLAMP®-equipped,12 AWG (4mm²) rail-mounted terminal block: **Increase of current without time limit.** In such an extreme test – normally, fuse devices would have interrupted the current – **the electrical connection is undamaged.**

TOPJOB®S Rail-Mounted Terminal Blocks 2000, 2001, 2002, 2004, 2006, 2010 and 2016 Series

Conductor termination/removal



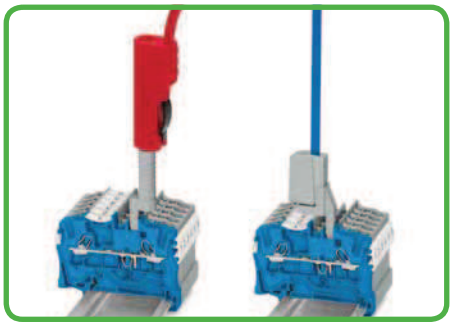
Push-in termination: Solid conductors with cross sections from either one size above, or up to two sizes below, the rated cross section can be pushed in directly – without tools.



With screwdriver: The operation of the clamp remains the same for unprepared fine-stranded conductors or small cross sections that don't allow push-in termination.

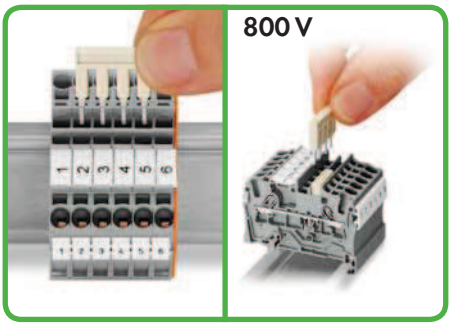
Like the original CAGE CLAMP®, a screwdriver is used for conductor removal with CAGE CLAMP®S.

Testing



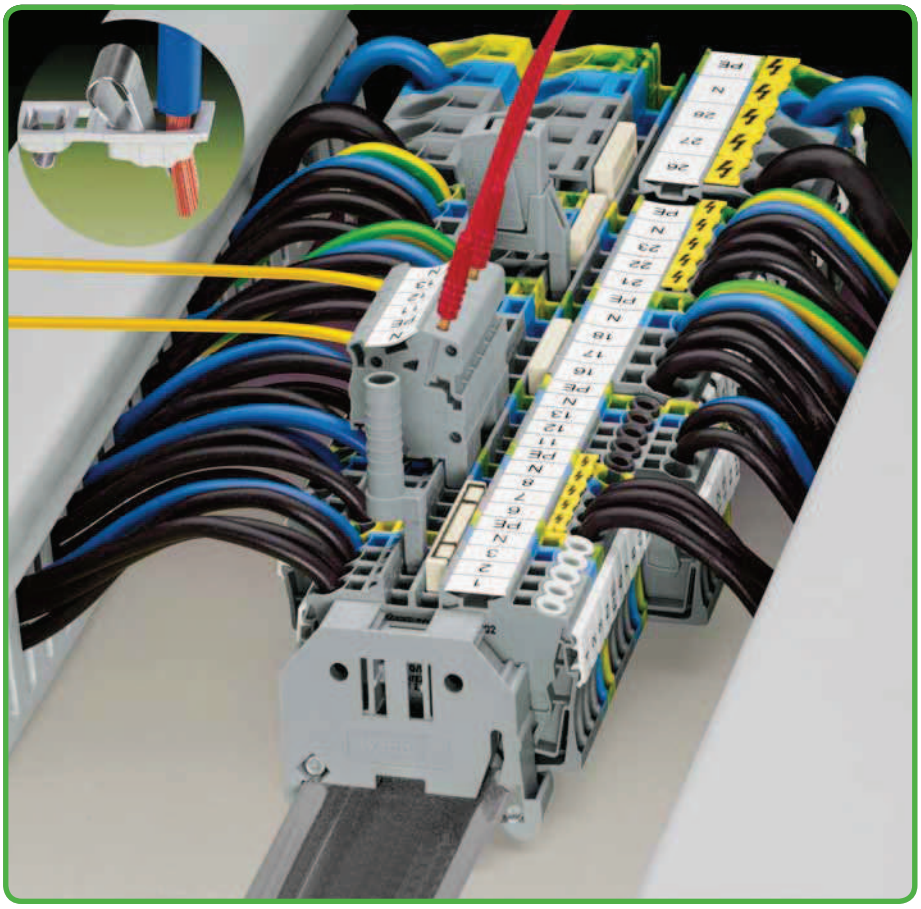
Testing of TOPJOB®S rail-mounted terminal blocks using test plug adapter or testing tap

Commoning

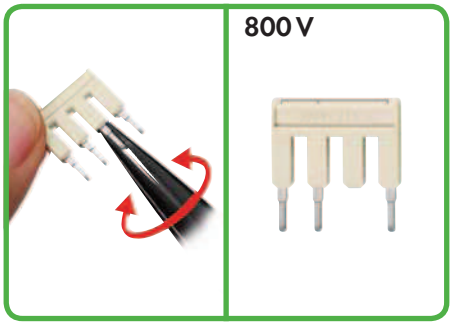


Twin integrated, spring-loaded jumper system allows use of comb-style jumper bars, test plugs and connectors.

Jumper bars rated at 800V (ex works).



Commoning

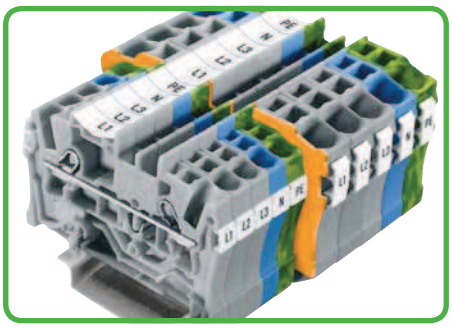


Jumper contacts that are not required can be broken off and removed, the upper-side of the jumper can then be marked accordingly. Applies to 2001, 2002 and 2004 Series.

Marking

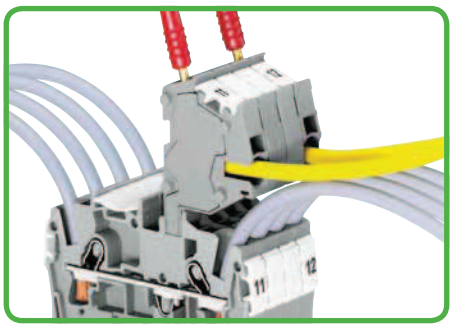


A thermal transfer printer and WAGO "smartDESIGNER" software generate the marking.



TOPJOB®S offers three marking positions for WMB markers, miniature WSB markers or a full-length marking strip.

Pre-assembled connectors



Pre-assembled connectors with CAGE CLAMP®S connection provide an additional connection option.

CAGE CLAMP®S clamps the following copper conductors:



solid | stranded | fine-stranded | tip bonded | with ferrule | with pin terminal

Strip length, see packaging or instructions.

TOPJOB®S
Rail-Mounted Terminal Blocks 1.0 (1.5) mm²
2000 Series

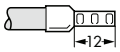
CAGE CLAMP®S

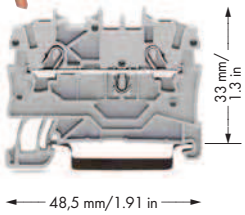
0.14 - 1.0 (1.5) mm² ❶	AWG 24 - 16
800 V/6 kV/3	600 V, 10 A
I_N 13.5 A (18 A)	600 V, 10 A

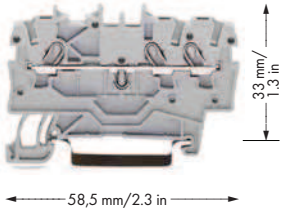
Terminal block width 3.5 mm / 0.138 in
9 - 11 mm / 0.39 in
❷ Approvals

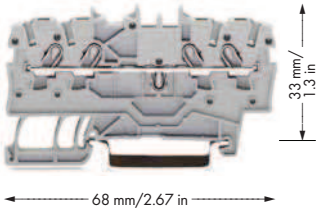
❶ Conductor sizes: 0.14 – 1.5 mm² "s + f-st";
Push-in conductor sizes: 0.5 – 1.5 mm² "s" and 0.5 – 1 mm² "insulated ferrule, 12 mm"











Color	Item No.	Pack. Unit
2-conductor through terminal block		
gray	**2000-1201**	100
blue	**2000-1204**	100
orange	**2000-1202**	100
red	**2000-1203**	100
black	**2000-1205**	100
yellow	**2000-1206**	100
2-conductor ground terminal block		
green-yellow	**2000-1207**	100

Color	Item No.	Pack. Unit
3-conductor through terminal block		
gray	**2000-1301**	100
blue	**2000-1304**	100
orange	**2000-1302**	100
red	**2000-1303**	100
black	**2000-1305**	100
yellow	**2000-1306**	100
3-conductor ground terminal block		
green-yellow	**2000-1307**	100

Color	Item No.	Pack. Unit
4-conductor through terminal block		
gray	**2000-1401**	100
blue	**2000-1404**	100
orange	**2000-1402**	100
red	**2000-1403**	100
black	**2000-1405**	100
yellow	**2000-1406**	100
4-conductor ground terminal block		
green-yellow	**2000-1407**	100

Item-Specific Accessories

End and intermediate plate, 0.7 mm thick



orange **2000-1292** 100 (4x25)
gray **2000-1291** 100 (4x25)

End and intermediate plate, 0.7 mm thick



orange **2000-1392** 100 (4x25)
gray **2000-1391** 100 (4x25)

End and intermediate plate, 0.7 mm thick



orange **2000-1492** 100 (4x25)
gray **2000-1491** 100 (4x25)

2000 Series Accessories

Appropriate marking systems: **WMB/Marking Strips**

Push-in type jumper bar, insulated, I_N 14 A, light gray



2-way **2000-402** 200 (8x25)
3-way **2000-403** 200 (8x25)
4-way **2000-404** 200 (8x25)
5-way **2000-405** 100 (4x25)
: :
10-way **2000-410** 100 (4x25)

Push-in type jumper bar, insulated, I_N 14 A, light gray



1 - 3 **2000-433** 200 (8x25)
1 - 4 **2000-434** 200 (8x25)
1 - 5 **2000-435** 100 (4x25)
: :
1 - 10 **2000-440** 100 (4x25)

Star point jumper, insulated,



I_N = I_N terminal block, light gray
1–3–5 **2000-405/011-000**
100 (4x25)

Protective warning marker, with high-voltage symbol,
for 5 terminal blocks



yellow **2000-115** 100 (4x25)

WMB Multi marking system,

10 strips with 10 markers per card
for 3.5 mm terminal block width,
plain **793-3501** 50 (10x5)

Marking strips, plain



11 mm wide,
50m roll
white **2009-110** 1

Operating tool with partially insulated shaft,



type 1, (2.5 x 0.4) mm blade
210-719 1

Suitable for Ex i applications

Test plug adapter, for test plug 4 mm Ø



gray **2009-174** 100 (4x25)

Insulated ferrules, extra long,
for TOPJOB®S terminal blocks
see page 195



Testing tap, for max. 2.5 mm²/AWG 14



gray **2009-182** 100 (4x25)

❷ Approvals are available online at: www.wago.com.

For technical explanations and abbreviations, see technical section.

WAGO®

TOPJOB®S
Through/Ground Conductor and Ex Terminal Blocks 1.5 (2.5) mm²
2001 Series

0.25 - 1.5 (2.5) mm² ❶ | **AWG 22 - 14**
800 V/8 kV/3 | **600 V, 10 A**
I_N 18 A (24 A) | **600 V, 10 A**
Terminal block width 4.2 mm / 0.165 in
9 – 11 mm / 0.39 in
❷ Approvals

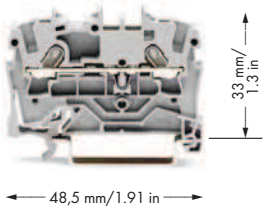
0.25 - 1.5 (2.5) mm² ❶ | **AWG 22 - 14**
800 V/8 kV/3 | **600 V, 10 A**
I_N 18 A (24 A) | **600 V, 10 A**
Terminal block width 4.2 mm / 0.165 in
9 – 11 mm / 0.39 in
❷ Approvals

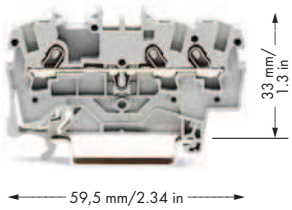
0.25 - 1.5 (2.5) mm² ❶ | **AWG 22 - 14**
800 V/8 kV/3 | **600 V, 10 A**
I_N 18 A (24 A) | **600 V, 10 A**
Terminal block width 4.2 mm / 0.165 in
9 – 11 mm / 0.39 in
❷ Approvals

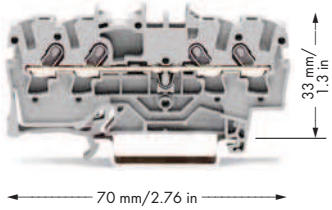


❶ Conductor sizes: 0.25 – 2.5 mm² "s + f-st";
Push-in conductor sizes: 0.5 – 2.5 mm² "s" and
0.75 – 1.5 mm² "insulated ferrule, 12 mm"









Color	Item No.	Pack. Unit
2-conductor through terminal block		
gray Ex	**2001-1201**	100
blue Ex	**2001-1204**	100
orange Ex	**2001-1202**	100
red Ex	**2001-1203**	100
black Ex	**2001-1205**	100
yellow Ex	**2001-1206**	100
2-conductor ground terminal block		
green-yellow Ex	**2001-1207**	100
Other terminal blocks with the same profile:		
Diode	**2001-1211/1000-411**	Volume 1

Color	Item No.	Pack. Unit
3-conductor through terminal block		
gray Ex	**2001-1301**	100
blue Ex	**2001-1304**	100
orange Ex	**2001-1302**	100
red Ex	**2001-1303**	100
black Ex	**2001-1305**	100
yellow Ex	**2001-1306**	100
3-conductor ground terminal block		
green-yellow Ex	**2001-1307**	100
Other terminal blocks with the same profile:		
Diode	**2001-1311/1000-411**	Volume 1
LED	**2001-1321/1000-434**	Volume 1

Color	Item No.	Pack. Unit
4-conductor through terminal block		
gray Ex	**2001-1401**	100
blue Ex	**2001-1404**	100
orange Ex	**2001-1402**	100
red Ex	**2001-1403**	100
black Ex	**2001-1405**	100
yellow Ex	**2001-1406**	100
4-conductor ground terminal block		
green-yellow Ex	**2001-1407**	100
Other terminal blocks with the same profile:		
Diode	**2001-1411/1000-411**	Volume 1
Diode	**2001-1411/1000-434**	Volume 1
Double-potential	**2001-1441**	Volume 1

Item-Specific Accessories

Separator for Ex e/Ex i applications, see page 30

End and intermediate plate, 0.8 mm thick



orange **2002-1292** 100 (4x25)
gray **2002-1291** 100 (4x25)

End and intermediate plate, 0.8 mm thick



orange **2002-1392** 100 (4x25)
gray **2002-1391** 100 (4x25)

End and intermediate plate, 0.8 mm thick



orange **2002-1492** 100 (4x25)
gray **2002-1491** 100 (4x25)

Separator, oversized, 0.8 mm thick



orange **2002-1294** 100 (4x25)
gray **2002-1293** 100 (4x25)

Separator, oversized, 0.8 mm thick



orange **2002-1394** 100 (4x25)
gray **2002-1393** 100 (4x25)

Separator, oversized, 0.8 mm thick



orange **2002-1494** 100 (4x25)
gray **2002-1493** 100 (4x25)

2001 Series Accessories

Appropriate marking systems: **WMB/Marking Strips**

Push-in type jumper bar, insulated, I_N 18 A, light gray



2-way **2001-402** 200 (8x25)
3-way **2001-403** 200 (8x25)
4-way **2001-404** 200 (8x25)
: :
10-way **2001-410** 100 (4x25)

Push-in type jumper bar, insulated, I_N 18 A, light gray



1 - 3 **2001-433** 200 (8x25)
1 - 4 **2001-434** 200 (8x25)
1 - 5 **2001-435** 100 (4x25)
: :
1 - 10 **2001-440** 100 (4x25)

Push-in type wire jumper, insulated, I_N 16 A,
wire size 1.5 mm²/AWG 16



60 mm **2009-412** 100 (10x10)
110 mm **2009-414** 100 (10x10)
250 mm **2009-416** 100 (10x10)

Insulation stop,



5 pcs/strip,
0.25 – 0.5 mm²
light gray **2001-171** 200 (8x25)

Protective warning marker, with high-voltage symbol,
for 5 terminal blocks



yellow **2001-115** 100 (4x25)

TOPJOB®S connector, modular,
for jumper contact slot



gray **2001-511** 100 (4x25)

Spacer module
gray **2001-549** 100 (4x25)

WMB Multi marking system,

10 strips with 10 markers per card,
stretchable 4 – 4.2 mm
plain **793-4501** 5

Suitable for Ex i applications
Suitable for Ex e II applications
550 V, 17 A

Operating tool with partially insulated shaft,



type 1, (2.5 x 0.4) mm blade
210-719 1

Marking strip, plain,



11 mm wide,
50m roll
white **2009-110** 1

Insulated ferrules, extra long,



for TOPJOB®S terminal blocks
see page 195

❷ Approvals are available online at: www.wago.com.

For technical explanations and abbreviations, see technical section.